DOCUMENT RESUME

ED 071 602 HE 003 738

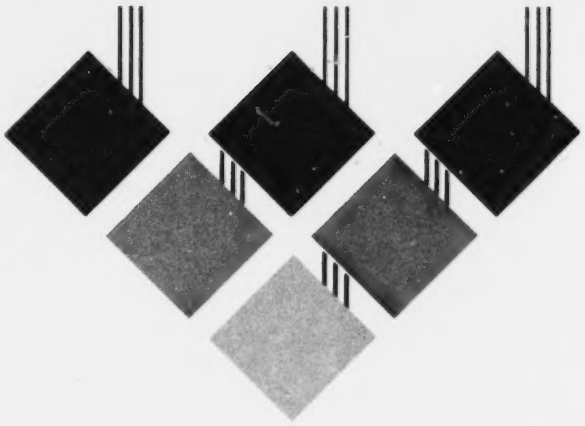
TITLE	An Annotated Bibliography on Graduate Education 1971-1972.
INSTITUTION	National Board on Graduate Education, Washington, D. C.
PUB DATE	Oct 72
NOTE	161p.
EDRS PRICE	MF-$0.65 HC-$6.58
DESCRIPTORS	*Annotated Bibliographies; *Educational Research; *Graduate Students; *Graduate Study; *Higher Education

ABSTRACT

This bibliography summarizes the most recent literature concerning graduate education. It is intended to be selective rather than exhaustive in its coverage, and the subject matter is mainly restricted to the traditional areas of graduate education. Representative publications focusing on or directly related to graduate education that were available for review during the period July 1, 1971 to August 1, 1972 are included. (HS)

FILMED FROM BEST AVAILABLE COPY

ED 071602

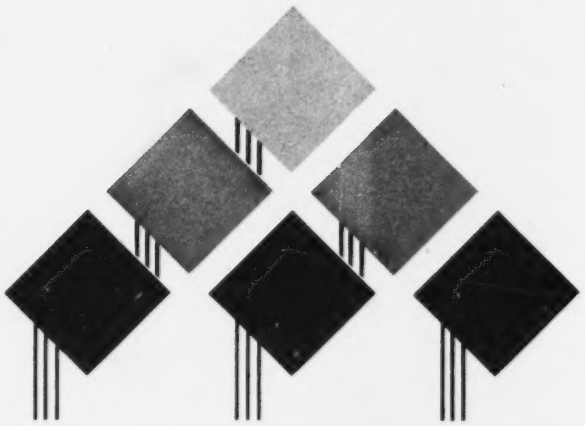


An Annotated Bibliography on Graduate Education

1971-1972

THE NATIONAL BOARD ON
GRADUATE
EDUCATION

HE 00 3 738



U.S. DEPARTMENT OF HEALTH
EDUCATION & WELFARE
OFFICE OF EDUCATION
THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL OFFICE OF EDUCATION POSITION OR POLICY.

ED 071602

AN ANNOTATED BIBLIOGRAPHY

ON GRADUATE EDUCATION

1971 - 1972

THE NATIONAL BOARD ON GRADUATE EDUCATION

2101 CONSTITUTION AVENUE, N.W.

WASHINGTON, D.C. 20418

OCTOBER, 1972

FOREWORD

Following a decade of unprecedented growth, graduate education today is undergoing the difficult transition to a new environment of slower growth, changing student aspirations, reduced support, and demands for alternative curricula. The problems, questions, and opportunities associated with this process of change create the need for a critical review of the purposes and practices of graduate education. Recognizing this imperative, the Conference Board of Associated Research Councils* established the National Board on Graduate Education in 1971 to provide a means for an unbiased, thorough analysis of graduate education today and of its relation to American society in the future.

The National Board on Graduate Education is an autonomous body of twenty-six persons from the academic, industrial, and public sectors, chosen for their knowledge and interest in graduate education. Members were selected by the Conference Board to serve as individuals rather than as representatives of constituencies. The Board's role is investigative and issue-oriented, with activities designed to provide a solid base of information and conceptual analysis to support its conclusions and recommendations.

In carrying out the Board's charge to focus upon the problems and issues surrounding graduate education and the Board's recommendations concerning them, the following staff activities have been defined:

(1) initiation of new research studies and the encouragement of experimentation and innovation;

(2) coordination and review of current research efforts and studies;

(3) dissemination of information and referrals for individuals, institutions, and agencies;

---

* Composed of the American Council on Education, the Social Science Research Council, the American Council of Learned Societies, and the National Research Council.

(4) preparation and circulation of a continuing annotated bibliography of literature on graduate education; and

(5) conduct of programs for the stimulation of public and professional discussion of the reports, findings, and recommendations of the National Board.

The present volume is a partial fulfillment of the fourth activity, the preparation of a bibliography on graduate education.

David D. Henry, Chairman
National Board on Graduate Education

October, 1972

NATIONAL BOARD ON GRADUATE EDUCATION

JOSEPH BEN-DAVID
Professor of Sociology
Hebrew University

DAVID BLACKWELL
Professor of Statistics
University of California-Berkeley

HERMAN R. BRANSON
President
Lincoln University

ALLAN M. CARTTER
Carnegie Commission of Higher Education

PAUL F. CHENEA
Vice President, Research Laboratories
General Motors Technical Center

W. DONALD COOKE
Dean of the Graduate School
Cornell University

JOHN P. CRECINE
Professor, Institute of Public Policy Studies
University of Michigan

EVERETT W. FERRILL
Professor of History
Ball State University

MARTIN GOLAND
President
Southwest Research Institute

NORMAN HACKERMAN
President
Rice University

DAVID HENRY, Chairman
Professor of Higher Education
University of Illinois

HANS LAUFER
Professor, The Biological Sciences
University of Connecticut

SOL M. LINOWITZ
Attorney
Coudert Brothers

ROBERT M. LUMIANSKY
Professor of English
University of Pennsylvania

MAURICE MANDELBAUM
Professor of Philosophy
The Johns Hopkins University

JAMES G. MARCH
School of Education
Stanford University

JOHN PERRY MILLER
Director, Institution for Social and Policy Studies
Yale University

JOHN D. MILLETT
Vice President and Director, Management Division
Academy for Educational Development, Inc.

HANS NEURATH
Chairman, Department of Biochemistry
University of Washington

ROSEMARY PARK
Professor of Higher Education
University of California-Los Angeles

MARTHA PETERSON
President
Barnard College

RICHARD C. RICHARDSON, JR.
President
Northampton County Area Community College

TERRY SANFORD
President
Duke University

STEPHEN H. SPURR
President
University of Texas

ROBERT STROTZ
President
Northwestern University

FREDERICK THIEME
President
University of Colorado

PREFACE

The present contribution continues and updates the Annotated Bibliography on Graduate Education, 1950-71 published in July, 1971, under the auspices of the Office of Scientific Personnel of the National Research Council as background for the National Board on Graduate Education. Because of the broad interest in and frequent requests for the original Bibliography, the National Board has decided to continue preparation and circulation of a bibliography on graduate education as a useful service to scholars, students, administrators, critics, and commentators concerned with graduate education. The present compilation, including materials reviewed through August 1, 1972, is in keeping with this objective.

The Board was very fortunate in securing the services of Dr. Wayne C. Hall as editor of the present publication. Dr. Hall supervised the preparation of the earlier Bibliography, and his knowledge and experience were essential to the successful completion of the present volume.

David W. Breneman, Staff Director
National Board on Graduate Education
2101 Constitution Avenue, N.W.
Washington, D. C. 20418

October, 1972

EDITOR'S INTRODUCTION

An Annotated Bibliography on Graduate Education, 1971-1972, summarizes the most recent literature concerning graduate education. As was true of the earlier Bibliography, the current publication is intended to be selective rather than exhaustive in its coverage. The subject matter is mainly restricted to the traditional areas of graduate education; references concerned primarily with professional fields such as medicine, law, or theology have generally been excluded. Representative publications focusing upon or directly related to graduate education which were available for review during the period July 1, 1971 to August 1, 1972 are included. However, an occasional earlier reference deemed to be of major interest, and unintentionally omitted in the original compilation, has been added.

The interest in graduate education, as evidenced by the volume of publications appearing in the literature, has not slackened--only the relative emphases have shifted. Graduate education continues to be a popular target for attack; however, the criticism has abated somewhat in favor of articles offering more constructive solutions and alternatives to the multitude of ills that currently beset graduate education. The themes of finance and governance, manpower supply and demand and employment opportunities, curricular and degree reforms, cooperation and coordination dominate the literature, but graduate education and programs for the disadvantaged and minority elements continues to receive major attention, with the feminist movement in the ascendancy. Student protest and unrest has diminished considerably and the papers dealing with the subject take a different slant than those appearing in the late 1960's.

The present Bibliography follows the original format of presenting the principal subject areas topically by author(s) or source(s) by major categories, with cross referencing provided. All pertinent references coming to our attention prior to August 1, 1972 are included; for the inadvertent omission of any important reference which should have been covered in our survey, we apologize.

Without the capable assistance of Miss Sandra Crowley, who served as the general project coordinator and integrator, and Mrs. Faith Ferguson and Mr. David Ewing, bibliographers and project assistants, this publication would not have been possible. Their contributions are gratefully acknowledged, as is the National Board on Graduate Education staff assistance in typing and proofing of the manuscript, and especially the support and encouragement of Dr. David W. Breneman, Staff Director of the National Board on Graduate Education, and Dr. W. C. Kelly, Director of the Office of Scientific Personnel, National Research Council.

Wayne C. Hall

October, 1972

TABLE OF CONTENTS

Foreword iii

Preface vii

Editor's Introduction ix

TOPICAL INDEX xiii

ADMINISTRATION AND FACULTY 1-5
- Quality of Faculty 1
- Governance and Unrest 2
- Tenure and Management 5

COSTS AND FINANCING OF HIGHER EDUCATION 7-32
- General Support, Economic Formulae & Models, Total & Unit Costs 7
- Structure and Functions 16
- Students and Stipends 18
- Changing Federal Support Policies 20
- Support and Funding: Federal Programs (R&D and Standardization of Financing), Private Foundation Programs, State Support 26

HISTORY AND DEVELOPMENT 33-43
- Colleges and Universities 33
- Academic Organizations 35
- Trends in Graduate Education 36

HUMAN RESOURCES - SUPPLY & DEMAND 45-71
- Statistical Surveys 45
- Employment Opportunities 47
- National Needs and Priorities 50
- Mobility and Utilization 58
- Enrollments, Projections and Goals 60

INSTRUCTION AND RESEARCH 73-95
- Degrees and Requirements; Problems Pertaining to Degrees; Admissions; and Research 73
- Programs (Including Curriculum, Field, Teacher Preparation, and Special) 87

STUDENTS 97-111
- Attitudes, Characteristics, Unrest 97
- Evaluation and Research on Students' Performance 99

Research on Students - General 102
Types of Students: Foreign, Minority, Disadvantaged . 107

WOMEN AS RELATED TO HIGHER EDUCATION 113-121
Women as Faculty 113
Women as Students 116
Women as Untapped Resource 120
Women - General 121

RECOMMENDATIONS FOR THE FUTURE 123-139
Programs, Curricula, and Degrees - Reforms and Changes . 123
Planning, Financing, and Coordination 129
National Science Policy and National Education Policy . 135
Public Service, Advisory and Research Committees, Evaluation and Measurement of Quality 138

TITLE INDEX 141

AUTHOR INDEX 149

• DEGREES AND REQUIREMENTS

General

Alpert, D., 73
Columbia Reports, 76
Gardner, E., 79
Hechinger, F., 80
May, W., 90
Rees, M., 84

Doctoral

Adams, R., 73
Alberty, R., 47
Cooke, W., 77
Deener, D., 78
Gardner, E., 79
Harvey, J., 48
Heiss, A., 80
National Research Council, 46
Packer, H., 83
Rees, M., 84
Shull, H., 41
Stanford University, 42, 126
Veri, C., 94

D.A. and Other Doctorates

Abbott, M., 73
American Association of State Colleges and Universities, 74
Ben-David, J., 36
Columbia Reports, 76
Council of Graduate Schools in the United States, 77
Dressel, P., & F. DeLisle, 78
Gardner, E., 79
Hechinger, F., 80
Koenker, R., 81
May, W., 90
Mayhew, L., 126
Miller, P., 91
Moreland, H., 82
Rees, M., 84
Stever, H., 85

Master's

Boddy, F., 74
Bohm, H., 75
Bureau of College Education, 75
Cobb, J., 76
Nelson, J., 82
Roaden, A., 56
Sanders, H., 84

Problems Pertaining to Degrees (Language Requirement, Length of Time to Degree, Dissertation, Field of Study)

Adams, R., 73
Alpert, D., 73
Arnold, J., 87
Brennan, M., 75
Bureau of College Education, 75
Columbia Reports, 76
Cooke, W., 77
Decker, R., 104
Harvey, J., 48, 105
Holmstrom, El, & L. Sharp, 19
Melnick, M., 106
Packer, H., 83
Rees, M., 84
Van Dyne, L., 93
Wenglinsky, M., 94
Wilson, K., 85
Wiltsey, R., 86

• DEGREE PRODUCTION

Alberty, R., 47
Bock, R., 60
Breneman, D., 8
Carnegie Commission on Higher Education, 62
Chronicle of Higher Education, 63
Falk, C., 63
Harvey, J., 48, 49
Jacobson, R., 65
Kidd, C., 45
Metz, D., 52
National Research Council, 46, 53, 58
National Science Foundation, 66, 91
Perloff, R., 55
Rosenhaupt, H., 56
Sells, L., 118
State of Illinois, 57
University of Maryland Graduate School, 70

TOPICAL INDEX

- ACADEMIC ORGANIZATIONS

Bronk, D., 35
Whaley, W., 35

- ACCREDITATION

Dickey, F., & J. Miller, 17
Silbert, W., 18

- ADMINISTRATIVE AND FACULTY SALARIES

Cameron, D., & P. Heim, 16
Higher Education and National Affairs, 10

- ADMISSIONS MECHANISMS AND STANDARDS

American Political Science Association, 99
Burns, R., 99
Crawford, B., 124
Graduate Record Examinations Board, 17, 101
Harvey, J., 80

- ASSISTANTSHIPS -- see ATTITUDES and UNIVERSITY SUPPORT PROGRAMS

- ATTITUDES (Faculty and Students)

Gregg, W., 104
Harvey, J., 105
Keniston, K., 97
MacNair, R., & W. Siembieda, 98
Melnick, M., 106
Meyerson, M., 98
Wilson, L., 43

- ATTRITION

Decker, R., 104

- AUTONOMY

McConnell, T., 23

- BIRTH RATES

Taeuber, C., 68

- CHANGING FEDERAL SUPPORT POLICIES

Abelson, P., 20
Bennett, I., 130
Brennan, M., 27
Brookings Study Group, 21
Campbell, R., & W. Boyd, 22
Federal Interagency Committee on Education, 18
Glenny, L., 132
Humphreys, L., 29
Kennedy, T., et al., 22
Kerr, C., 133
Kidd, C., 23
McConnell, T., 23
National Science Foundation, 24
Reitz, J., 24

- COMMUNITY AND JUNIOR COLLEGES

Burke, W., 130
Huther, J., 49
Roaden, A., 56
Weisinger, H., 127

- CURRICULA -- see PROGRAMS (Curriculum), General

Vaughan, T., & G. Sjoberg, 70
Vetter, B., 71
Wolfle, D., & C. Kidd, 50

• ECONOMIC FORMULAE, MODELS, TOTAL AND UNIT COSTS

Balderston, F., 7
_____, & G. Weathersby, 129
Breneman, D., 8
Carnegie Commission on Higher Education, 131
Fram, E., 9
Halpern, J., 10
Lamson, R., 11
McCarthy, J., & D. Deener, 12
National Science Foundation, 66
Powel, J., & R. Lamson, 13
State University of New York, 14
Wagner, W., & G. Weathersby, 15
Weathersby, G., 15

• ENROLLMENTS
(Rate and Projections)

Abelson, P., 20
Burns, R., 61
Carnegie Commission on Higher Education, 62
Chemical and Engineering News, 62
Chronicle of Higher Education, 63
Hansen, H., 64
Holden, C., 52
Ingham, R., et al., 64
Jellema, W., 65
Kidd, C., 45
Moses, L., 65
National Center for Educational Statistics, 69
National Science Foundation, 66, 67
Orwig, M., et al., 68
Thompson, R., 69
University of Maryland Graduate School, 70
Vetter, B., 71

• EVALUATION OF STUDENTS' PERFORMANCE

American Political Science Association, 99
Burns, R., 99
Educational Testing Service, 100
Flaugher, R., 100
Graduate Record Examinations Board, 101
Lannholm, G., 101

• EXTERNAL COOPERATION AMONG INSTITUTIONS, GOVERNMENTS, BUSINESS AND INDUSTRY

Alderman, J., 16
Arnold, J., 87
Glenny, L., 132
Rees, M., 84

• FEDERAL SUPPORT PROGRAMS
(Fellowships, Grants, Loans, etc., HEW, NDEA, NIH, NSF, State Dept.)

Brennan, M., 27
Carnegie Commission on Higher Education, 131
Federal Interagency Committee on Education, 18, 29
Fontaine, T., 19
Humphreys, L., 29
Kennedy, T., et al., 22
Kidd, C., 23, 45
Lemonick, A., 30
National Science Foundation, 20, 24, 67
Office of Education (HEW), 31
Reitz, J., 24
Sharp, L., et al., 30
State University of New York, 14
U. S. Congress, Joint Economic Committee, 134
Young, M., & R. Bock, 25

• FOREIGN INFLUENCES ON GRADUATE EDUCATION

American Council on Education, 27
Metz, D., 52

- FOREIGN STUDENTS

Agency for International Development, 111
Harari, M., 107
Sasnett, M., & I. Sepmyer, 109
Task Force on Crucial Issues of NAFSA, 110

- GENERAL FINANCIAL SUPPORT

Adams, V., 7
Carnegie Commission on Higher Education, 28
Chambers, M., 28
Cheit, E., 9
Fram, E., 9
Jenny, H., & G. Wynn, 11
Shulman, C., 30
U. S. Congress, Joint Economic Committee, 134

- GOVERNANCE (Role of Administrators, Faculty, and Students)

Boyer, E., 2
Lloyd, W., 3
Meyerson, M., 98
Western Association of Graduate Schools, 4

- GRADUATE EDUCATION'S EFFECT ON UNDERGRADUATE EDUCATION

Arrowsmith, W., 88
Rice, P., 40

- HISTORY AND DEVELOPMENT OF COLLEGES AND UNIVERSITIES

Handlin, O., & M. Handlin, 33
Hobbs, N., 33
Kerr, C., 133
Roose, K., 34
Snow, C., & P. Snow, 34
Stanford University, 42

- HUMAN RESOURCES--SUPPLY AND DEMAND

Employment Opportunities

Astin, H., et al., 121
DeWitt, L., & A. Tussing, 48
Harvey, J., 48, 49
Huther, J., 49
National Education Association, 53
National Research Council, 53
National Science Foundation, 46, 54
U. S. Department of Labor, 60
Verplanck, W., 57
Vetter, B., 49
Weathersby, G., 57
Wolfle, D., & C. Kidd, 50

Mobility and Utilization

DeWitt, L., & A. Tussing, 48
Harvey, J., 107
Hiestand, D., 105
Morris, J., 58
National Education Association, 53
National Research Council, 59
National Science Foundation, 46
Sells, L., 121
U. S. Commission on Civil Rights, 110

National Needs

Alberty, R., 47
Brode, W., 61
Cairns, T., 50
DeWitt, L., & A. Tussing, 48
Ginzberg, E., 51
Harvey, J., 49
Holden, C., 52
National Research Council, 58, 59
National Science Board, 54
National Science Foundation, 46, 54, 66
Perloff, R., 55
Polinger, M., 55
Roaden, A., 56
Rose, R., 56
State of Illinois, 57
U. S. Department of Labor, 60

Vetter, B., 71
Weathersby, G., 57
Young, M., & R. Bock, 25
Zuckerman, H., & R. Merton, 95

National Priorities

Freeman, R., 51
Ginzberg, E., 51
Vaughan, T., & G. Sjoberg, 70
Vetter, B., 71
Weathersby, G., 57

Projections of Manpower Needs

Balderston, F., & R. Radner, 60
Bock, R., 60
Brode, W., 61
Carnegie Commission on Higher Education, 62
DeWitt, L., & A. Tussing, 48
Freeman, R., 51
Jacobson, R., 65
National Science Foundation, 54, 66
Perloff, M., 55
Rose, R., 56
U. S. Department of Labor, 60
University of Maryland Graduate School, 70
Vaughan, T., & G. Sjoberg, 70
Vetter, B., 49

Statistical Surveys

Council of Graduate Schools in the United States, 45
Kidd, C., 45
National Research Council, 46, 58
National Science Foundation, 46, 54

See also: DEGREE PRODUCTION, ENROLLMENTS, WOMEN - As Untapped Resources

• INSTITUTIONAL RESEARCH
(Self-evaluation)

Graduate Record Examinations Board, 38
Harvard University Faculty of Arts & Sciences, 38
Windle, J., et al., 86

• LIBRARIES

Cameron, D., & P. Heim, 16
Dressel, P., & S. Pratt, 79

• MANPOWER -- see HUMAN RESOURCES

• MINORITY STUDENTS

Astin, H., et al., 107
Flaugher, R., 100
Harvey, J., 107
Howard, B., 108
Mack, G., 109
Parry, M., 109
U. S. Commission on Civil Rights, 110

• POSTDOCTORAL PROGRAMS

National Research Council, 59

• PRIVATE SUPPORT--FOUNDATION AND OTHER

American Association of Fund-Raising Counsel, 26
American Council on Education, 26, 27
Woodrow Wilson Foundation, 119

• PROGRAMS
(Curriculum)

General

Arnold, J., 87
Arrowsmith, W., 88
Brennan, M., 75
Bureau of Social Science Research, Inc., 102
Carnegie Commission on Higher Education, 103, 124
Eurich, A., 132
Graduate Record Examinations Board, 17
Perloff, R., 55

Education (Teacher Preparation)

Ben-David, J., 36
Cobb, J., 76
Dressel, P., & F. DeLisle, 78, 88
Koen, F., & S. Ericksen, 90
Mayhew, L., 126
Miller, P., 91
Moreland, H., 82
Nelson, J., 82
Noonan, J., 92
Pappas, E., 92
Veri, C., 94

Engineering

American Society for Engineering Education, 87
Drucker, D., 88
National Science Foundation, 91
Sanders, H., 84
State of Illinois, 57

Humanities

Arrowsmith, W., 88
Brennan, M., 75

Interdisciplinary

Cairns, T., 50

Sciences

Abelson, P., 135
Chemical and Engineering News, 62
Elton, C., & S. Rodgers, 138
Hawkridge, D., 89
National Research Council, 134
National Science Foundation, 66, 91
Young, M., & R. Bock, 25
Zuckerman, H., & R. Merton, 95

Social Sciences

American Political Science Association, 99, 123
Booth, D., 123
Wenglinsky, M., 94

Special (Innovations, Continuing Education, Disadvantaged, etc.)

Carnegie Commission on Higher Education, 124
Hadley, P., 89
Hawkridge, D., 89
May, W., 90
Van Dyne, L., 93

Vocational and Technical

Arnold, J., 87

• QUALITY OF FACULTY

Cartter, A., 1
Eckert, R., 1
Koen, F., & S. Ericksen, 90

• RECOMMENDATIONS FOR THE FUTURE

Disciplinary and Interdisciplinary Programs

American Political Science Association, 123
Hackerman, N., 133

Measurements of Quality (Criteria)

Elton, C., & S. Rodgers, 138
Harvard University Faculty of Arts and Sciences, 38
Wilson, L., 135

National Policy for Graduate Education

American Political Science Association, 123
Brademas, J., 136
Carnegie Commission on Higher Education, 131
Education Commission of the States, 136
Gershinowitz, H., 138
National Science Board, 54

National Science Policy

Abelson, P., 135
Bennett, I., 130
National Research Council, 139
National Science Board, 54
The President's Message to Congress, 137
Stever, H., 137

Planning, Financing, and Coordination of Graduate Education

Abelson, P., 135
Balderston, F., & G. Weathersby, 129
_____,& R. Radner, 60
Bennett, I., 130
Brademas, J., 136
Breneman, D., 8
Burke, W., 130
Carnegie Commission on Higher Education, 62, 131
Eurich, A., 132
Glenny, L., 132
Hackerman, N., 133
Kerr, C., 133
Magoun, H., 134
National Research Council, 134
Rice, P., 40
U. S. Congress, Joint Economic Committee, 134
Wilson, L., 135

Programs, Curricula, and Degrees

American Political Science Association, 123
Brademas, J., 136
Breneman, D., 8
Carnegie Commission on Higher Education, 103, 124, 131
Decker, R., 104
Gorter, W., 125
Hackerman, N., 133
Heiss, A., 80
Mayhew, L., 125, 126
Stanford University, 126
Tilly, C., 127
Whaley, W., 128

Public Service

Gershinowitz, H., 138
National Research Council, 139

Reforms and Changes in Graduate Education

Booth, D., 123
Crawford, B., 124
Gorter, W., 125
Heiss, A., 125
Kenniston, K., 97
Kerr, C., 133
May, W., 90
Mayhew, L., 125, 126
Packer, H., 83
Stanford University, 126
Tilly, C., 127
Weisinger, H., 127
Wenglinsky, M., 94
Whaley, W., 128
Wilson, L., 43, 135

• RESEARCH AND DEVELOPMENT FUNDING

National Science Foundation, 24
State of New York, Washington Office, 14
Stever, H., 31
U. S. News & World Report, 32

• RESEARCH
(Applied, Basic, Individual, Institutional, and Sponsored)

Brademas, J., 136
Crawford, B., 124
Dillon, J., et al., 78
Dressel, P., & S. Pratt, 79
Gershinowitz, H., 138
National Research Council, 134, 139
Orlans, H., 83
Stever, H., 31
Windle, J., et al., 86

- RESEARCH ON STUDENTS

Astin, H., et al., 107
_____, & T. Myint, 117
Bayer, A., & A. Astin, 97
Bureau of Social Science Research, Inc., 102
Carnegie Commission on Higher Education, 103
Creager, J., 103
Decker, R., 104
Flaugher, R., 100
Gardner, E., 79
Gregg, W., 104
Harvey, J., 105
Hiestand, D., 105
Keniston, K., 97
MacNair, R., & W. Siembieda, 98
Melnick, M., 106
National Research Council, 53
Parry, M., 109
Scheader, C., 106
Task Force on Crucial Issues in NAFSA, 110
Windle, J., et al., 86
Woodrow Wilson Foundation, 119

- STATE SUPPORT

Carnegie Commission on Higher Education, 28
Chambers, M., 28
Shulman, C., 30

- STRUCTURE OF EDUCATIONAL INSTITUTIONS

Eurich, A., 132
Wagner, W., & G. Weathersby, 15

- STUDENT STIPENDS

Federal Interagency Committee on Education, 18
Fontaine, T., 19
Holmstrom, E., & L. Sharp, 19
National Science Foundation, 20

See also: UNIVERSITY SUPPORT PROGRAMS

- TEACHING VERSUS RESEARCH

Abbott, M., 73
Ben-David, J., 36
Carnegie Commission on Higher Education, 103
Wilkinson, E., 4

- TENURE OF FACULTY

Carr, R., 5
Cartter, A., 1
Fields, C., 113
Shulman, C., 5

- TRENDS IN THE DEVELOPMENT OF GRADUATE EDUCATION

Abelson, P., 20
Ashby, E., 36
Ben-David, J., 36
Booth, D., 123
Brennan, M., 27
Bureau of Social Science Research, Inc., 102
Daniels, G., 37
Gagnon, J., 37
Glenny, L., 132
Graduate Record Examinations Board, 38
Handlin, O., & M. Handlin, 33
Harvard University, 114
Heiss, A., 125
Ingham, R., et al., 64
Kaysen, C., 34
Kent, L., & G. Springer, 39
Kidd, C., 23, 45
Koen, F., & S. Ericksen, 90
Lucki, E., 39
Mayhew, L., 40, 126
Metz, D., 52

National Science Foundation, 67
Office of Education (HEW), 42
Perloff, R., 55
Rees, M., 84
Rice, P., 40
Rosenhaupt, H., 56
Shull, H., 41
Southern Regional Education Board, 41
Stanford University, 126
University of Maryland Graduate School, 42
Van Dyne, L., 93
Verplanck, W., 57
Weisinger, H., 127
Wilson, L., 43
Woodring, P., 43

• UNIVERSITY SUPPORT PROGRAMS (T.A.'s, R.A.'s, Fellowships)

Brennan, M., 27
Burns, R., 61
National Science Foundation, 20, 67
Parry, M., 109

• UNREST

Role of Administrators

Carnegie Commission on Higher Education, 2
Wilkinson, E., 4

Role of Faculty

Carnegie Commission on Higher Education, 2
Lipset, S., & E. Ladd, 3
Wilkinson, E., 4

Role of Students

Bayer, A., & A. Astin, 97
Carnegie Commission on Higher Education, 2
Keniston, K., 97
Meyerson, M., 98

• UTILIZATION OF UNTAPPED RESOURCES -- see HUMAN RESOURCES, Mobility and Utilization and WOMEN, as Untapped Resource

• WOMEN

General

Astin, H., et al., 121
Heyns, R., et al., 121
Sells, L., 121

As Faculty

Ad Hoc Committee of the Coordinating Committee on Graduate Affairs, 116
Arter, M., 120
Astin, H., 113
_____, et al., 121
Fields, C., 113
Harvard University, 114
Heyns, R., et al., 121
Lewin, A., & L. Duchan, 114
Michigan State University, 115
Robinson, L., 115
Rossi, A., 116

As Students

Ad Hoc Committee of the Coordinating Committee on Graduate Affairs, 116
Astin, H., et al., 121
_____, & T. Myint, 117
Fox, G., 117
Harvard University, 114
Kramer, N., 118
Mack. G., 109
Michigan State University, 115
Pifer, A., 118
Sells, L., 118
Stokes, S., 119
Woodrow Wilson Foundation, 119

As Untapped Resource

Arter, M., 120
Astin, H., 113
_____, et al., 121
Fields, C., 113
Houser, C., 120
Kramer, N., 118
Lewin, A., & L. Duchan, 114
Pifer, A., 118
Robinson, L., 115
Rossi, A., 116
Sells, L., 121
Tilly, C., 127

ADMINISTRATION AND FACULTY

QUALITY OF FACULTY

- Cartter, Allan

  Ph.D.'s Coming and Going (letters section)

  Science, Volume CLXXIII, No. 3991, 7, July 2, 1971.

  Cartter responds to several "Letters to the Editor," commenting on his earlier paper in Science. He agrees that higher education could stagnate if some means is not found for a constant influx of bright young scholars into the system, which up to now has been provided by the expansion of the market. Cartter reemphasizes that the alternatives he suggested--opportunities to replace nonproductive faculty, early retirement plans, change in tenure systems, etc.--should be considered. He does not feel as optimistic as Bock about the possibilities of stabilizing doctoral output in many fields, and concludes that Wisconsin is somewhat unique to most states in the control of its graduate programs.

- Eckert, Ruth E.

  Age and the College Teacher

  AAUP Bulletin, Volume LVIII, No. 1, 40-43, Spring, 1972.

  Eckert identifies three age groups of college faculty in the state of Minnesota: those 50 years of age or older, constituting 26% of the faculty; those 35 to 49 years of age (47%), and those under 35 (27%). She discusses characteristics of the groups, when and why they selected an academic career, how they prepared for faculty service, their current roles in academic life, their feeling with regard to their career choice, and their reactions to their doctoral training. Four general suggestions for the improvement of college teaching are advanced: more recruitment to college teaching as a career; better preparation for teaching; more effective utilization of the enormous drive and energy of faculty in mid-career; and studies of learning and individual development over the 70-year life span, with the purpose of enhancing opportunities for self-renewal for as many years as possible.

GOVERNANCE AND UNREST

- Boyer, Ernest L.

  A Fond Farewell to the Status Quo

  College Management, Volume VII, No. 7, 19-21, July, 1972.

  The author's thesis is that colleges and universities can do more with less only through better management, and he sees four trends which seem to have significant implications for educational management: the level of opportunity in higher education will continue to expand during the 1970's because learning is a lifetime process and because of the "everlasting itch" of Americans for learning; the context of higher education will radically change and the educational process will be fundamentally altered--the new models must contain more openness and flexibility, and the campus is becoming a base of operation, a point of departure; institutional cooperation will become imperative, and genuine moves toward cooperation will be a major trend in the 1970's; and accountability will become required and is inevitable--this requires institutional research focusing on educational issues of consequence, and attention must be given to interpreting and explaining our findings.

  It is suggested that universities should have, at the vice presidential level, a flexible staff unit devoted exclusively to two interlocking functions: policy and planning, and analytical study.

- The Carnegie Commission on Higher Education

  Dissent and Disruption: Proposals for Consideration by the Campus

  McGraw-Hill Book Company for The Carnegie Commission on Higher Education. New York. June, 1971.

  The report begins by structuring a dichotomy between dissent, which it feels must be protected, and disruption, which it feels must end. To achieve the end of disruption, solutions must be aimed at the small minority of disrupters specifically and not higher education in general. At the same time, repression must be prevented as well as "unnecessary harshness by law enforcement officers." The Commission traces these dissatisfactions within the academic community to a host of problems now under consideration by the society as a whole. They predict that this dissatisfaction will continue into the future, rising and falling to the externalities of societal pressure.

  The Commission recommends several steps: adoption, campus by campus, of a "bill of rights and responsibilities" examples of which are attached, as is a model; contingency planning with local law enforcement agencies to smash disruption early; creation on a campus-by-campus basis of judicial groups composed of external panels and persons.

  To a large extent the recommendations track the findings and conclusions of the President's Commission on Campus Unrest. Finally, they conclude that the burden lies with the faculty members whose alertness and willingness to change and to cope with problems is the ultimate safety valve.

- Lipset, Seymour Martin, and Everett C. Ladd, Jr.

  The Divided Professoriate

  Change, Volume III, No. 3, 54-60, May-June, 1971

  The authors believe that an appreciation of the complexity of the present crisis in higher education can only be understood in terms of a drastically transformed professoriate. They base their analyses on the responses of about 58,000 faculty members at four-year colleges and universities to a survey conducted in the spring of 1969 by The Carnegie Commission on Higher Education.

  Lipset and Ladd attribute the division in the professoriate to the wide disparity in its range of fields, substantive interests and outside associations, career lines, and expectations and social backgrounds. The authors believe that a "junior faculty with rather high expectations as to their due and considerable insecurity as low men in a very competive meritocracy, and little time to develop stakes and attachments in the institutions before they must, by choice or necessity, expect to move on--appear as a force for change in the university." The authors relate this disparity to the issues facing the academic community: research versus teaching, campus disorders, decision-making and governance, self-image as a profession, and the autonomy of the university. The authors conclude that universities will face these problems long into the future.

- Lloyd, Wesley P.

  Graduate Deans as Administrators

  Graduate Education Today and Tomorrow. Leonard J. Kent and George P. Springer editors. University of New Mexico Press. Albuquerque. 56-68. 1972.

  Dean Lloyd discusses some of the problems faced by graduate deans and the difficulties of shifting from teaching and research into administration. He sees the tasks of the graduate dean as being academically responsible, as well as socially sensitive. Administrative problems which call for continuous attention are: the need for an adequate supply of professors who are concerned about the student and his values; the gradual reduction in the close working relationship of students and professors due to increasing costs; the critical need to produce good graduate teachers in addition to specialists in research; the urgency for developing close working relationships among related departments, both within the university and on an inter-university basis; communicating workable ideas and procedures to the departments to demonstrate concern for the success of the graduate student. The graduate dean is depicted as the ideal person to combine academic spirit and action with creative insights in education.

- Western Association of Graduate Schools

  Proceedings of the Ninth Annual Meeting

  Western Association of Graduate Schools. Honolulu, Hawaii, March 6-7, 1967.

  This is the report of the 1967 conference of the Western Association of Graduate Schools. The first general session of the meeting dealt with the plight of the graduate dean and his lack of power in the graduate school. The second general session offered information concerning recent institutional research on graduate education, including evaluative studies by students of the graduate curricula. The third session was concerned with administrative aids such as computer information systems, and the fourth general session addressed the topic of special problems for research on graduate education. The fifth session was a business meeting at which new officers were elected and various recommendations made, and the final session dealt with financial aid to graduate education.

- Wilkinson, Ernest L.

  Academic Anarchy vs. Management of Universities

  Phi Kappa Phi Journal, Volume LI, No. 4, 30-40, Fall, 1971.

  The author, as President of Brigham Young University, reviews the disturbances that have occurred on the campuses in America (1785 demonstrations on 2300 college campuses in FY 1970) and concludes that the problem is not one of normal academic unrest, but of academic disruption, violence, and anarchy. The thrust of the most destructive riots is the "destruction of our existing social order," and "the leaders seize on any issue that will accomplish their aims, whether it be the minority question, Vietnam, or Cambodia."

  Wilkinson recommends 11 suggestions for better control and management of the university to curb destructive influences, disturbances, and riots so that universities can accomplish their basic educational mission. These center on a highly centralized, authoritative system of rigid control of responsibilities from the Board of Trustees to the student, and the author advocates strict enforcement of regulations and laws. More emphasis upon teaching, better business management, and direct subsidization of students instead of institutions are recommended.

TENURE AND MANAGEMENT

- Carr, Robert K.

  The Uneasy Future of Academic Tenure

  Educational Record, Volume LIII, No. 2, 119-127, Spring, 1972.

  Dr. Carr weighs the case for and against academic tenure. He concludes that the system "need not be abandoned as an ideal," but that it must be made "more acceptable as a practice." He details specific steps that colleges and universities and faculties can take immediately within the system to preserve it, yet accommodate pressures for change and ward off the threat of external control.

- Shulman, Carol Herrnstadt

  The Tenure Debate

  ERIC Clearinghouse on Higher Education. Washington, D. C. October, 1971.

  This review examines recent economic, political, and legal developments that have created pressure for reform of the academic tenure system, codified in 1940 by the American Association of University Professors and the Association of American Colleges. At issue are problems of academic freedom, "deadwood" faculty, institutional finances, and the nonrenewal of probationary teachers' contracts. The present tenure system allows college faculty a seven-year probationary period after which they must receive life employment or be dismissed by their institution. Arguments for and against this system as well as alternative tenure systems in effect at several institutions are given. A list of 29 references is included.

COSTS AND FINANCING OF HIGHER EDUCATION

COSTS AND FINANCING: GENERAL SUPPORT, ECONOMIC FORMULAE AND MODELS, TOTAL AND UNIT COSTS

- Adams, Velma A.

The Cost of Higher Education, 1971-72

College Management, Volume VII, No. 1, 10-15, January, 1972.

Building on information obtained from last year's study and in the months since then, College Management presents, with some variations, the results of its latest study on the cost of higher education. The costs, to the surprise of no one, have risen 25% since 1969-70, but degree-credit enrollment only increased approximately 17% according to the article. The total markup for higher education in the U. S. was $26.5 billion, a $5.3 billion increase in two years without allowance for inflation or change in the dollar's value. Two major factors contributing to the rise in overall costs were operation and maintenance and auxiliary enterprises; this includes labor and fringe benefits, libraries, and multimedia centers.

This far-ranging article explores the various facets of higher educational expenditures and costs and develops comparative and graphic data illustrating the federal government's contribution; tuition revenues; salary costs, which although the largest part of the budget, have not kept pace with the rise in the cost of living; and the lack of a common base to derive a national index of the comparative costs due to wide variability from state to state and among institutions. The budget crunch, although having some positive and beneficial effects, has not fostered the educational innovations or reforms initially hoped for by some administrators--new measures are necessary for the survival of many institutions; missions will have to be redefined, and alternative methods of education and its support will have to be devised and adopted.

- Balderston, Frederick E.

Varieties of Financial Crisis

Ford Foundation Program for Research in University Administration, Grant No. 680-267A, Paper P-29. Office of the Vice President--Planning, University of California. Berkeley, California. March, 1972.

This paper is one of a series of reports done under the Ford Foundation-sponsored Research Program. The author examines the various forms of financial stress that academic institutions may face (he prefers the term "stress" to "crisis" because the latter implies a peak of tension and then are discussed; the cost trends in various academic operations are described and the major educational resources used in terms of costs are reviewed. It is concluded that the federal government is the only source that can alleviate financial problems facing higher education.

- Breneman, David W.

The Ph.D. Degree at Berkeley: Interviews, Placement, and Recommendations

Ford Foundation Program for Research in University Administration, Grant No. 68-267, Paper P-17, Office of the Vice President--Planning and Analysis, University of California. Berkeley. January, 1971.

This third report of a series completes the author's presentation of empirical data in support of the behavioral, demand-oriented theory of Ph.D. production. A close examination of the Ph.D. curricula of the English, Economics, and Chemistry departments at Berkeley, chosen as representative of the extremes of departmental behavior, demonstrates that requirements do differ substantially and in a way designed to affect Ph.D. production. Interviews with the doctoral students and faculty give a picture of the changes in curriculum in the last twenty years and the attitudes of both groups regarding factors perceived as affecting time to degree and attrition. The concluding section contains recommendations for university policy suggested by economic analysis. Emphasis is placed on shifts away from input measures such as enrollment and student credits toward use of output measures such as number of degrees produced. It is suggested that graduate enrollment quotas should be reduced for those departments showing excessive attrition, allocating the positions released to departments indicating a willingness to produce and an ability to place more Ph.D.'s. It is recommended that applicants to doctoral programs be provided with detailed information on the historic performance of the department, including information on the probability of earning the Ph.D., mean time to degree, student support, and recent placement experience of the department. The author further recommends that enrollment quotas be consistent with each department's desired output and that departments be encouraged to discover unfilled needs for training and create new programs to fill those needs.

- Breneman, David W.

The Ph.D. Production Function: The Case at Berkeley

Ford Foundation Program for Research in University Administration, Grant No. 068-0267A, Paper-16. Office of the Vice President--Planning, University of California. Berkeley. December, 1970.

This report is the second of three papers analyzing departmental variations in time to degree and attrition in Ph.D. programs at Berkeley. The first paper, "An Economic Theory of Ph.D. Production: The Case at Berkeley," developed a behavioral theory to explain departmental differences in performance. The present paper considers an alternative hypothesis, the Ph.D. production function, which is examined by cross-section econometric analysis of 28 departments. The inputs included in the production function were student variables--quality and percent male; faculty variables--quality and number; and stipend support variables--number of T.A.'s, R.A.'s and fellowships. Estimates are given for the relative importance of each variable in explaining length of time to degree and attrition. The author argues that fellowships and research assistantships reflect the external market demand for Ph.D.'s, while teaching assistantships reflect the university's internal demand for instructional support. This interpretation leads to the question

of whether a large increase in graduate student financial support, unaccompanied by growing market demands, would result in a greater output of Ph.D.'s. The production function and behavioral hypotheses are integrated by relating departmental differences in resources to an index of excess demand for Ph.D.'s by field. The author suggests that the production function hypothesis may be misleading, for increased resources unaccompanied by increased market demand may not lead to increased Ph.D. production. The paper concludes with an examination of the national production of new Ph.D.'s during the period 1947-48 to 1967-68, focusing on Berkeley's relation to total supply. It is argued that analysis of the supply side further strengthens the behavioral, demand-oriented hypothesis presented in the first paper.

- Cheit, Earl F.

The New Depression in Higher Education: A Study of Financial Conditions at 41 Colleges and Universities

McGraw-Hill Book Company for The Carnegie Commission on Higher Education and the Ford Foundation. New York. 1971.

This work was sponsored by The Carnegie Commission and the Ford Foundation in response to requests made by many presidents of colleges and universities. The main effort of the study answers three questions: the characteristics of the financial problem facing higher education, how general is the problem among institutions of different types, and how the institutions have been responding to their financial problems. A fourth question concerning the effects of medical schools on university costs is considered, and the author presents his personal views on other related questions.

The 41 institutions selected for the study were broadly representative of six types and included both state and private institutions: national research universities, leading regional research universities, state and comprehensive colleges, liberal arts colleges, primarily black colleges, and two-year colleges. Visitations were made to the 41 schools and their financial condition verified by candid interviews with presidents and top financial-aid officers, and by review of financial records. Institutions were classified as "in financial difficulty," "headed for financial difficulty," or "not financial trouble." Cheit determined that 71% were either headed for financial trouble or already there; this group included some of the country's most prestigious universities. Many colleges and universities are staying in business only by sacrificing some of the quality and services normally considered essential to their programs.

- Fram, Eugene

We Must Market Education

The Chronicle of Higher Education, Volume VI, No. 28, 8, April 17, 1972.

The author proposes the application and usefulness of marketing functions as they relate to higher education enrollment and financial problems, and discusses principles, well proven through marketing experience, which have been violated by decision makers in higher education. He presents

four guidelines as examples of marketing principles that can be applied to higher education: in the final analysis, consumers are the ones who will accept or reject any price; a warranty is important in marketing high-priced products; properly employed, advertising requires the right product, at the right time, at the right price; and customers must be taught to use a product.

Other principles that could be explored and adapted are: to be a bargain, a product must be recognized as such by customers; there may be a difference between customer statements and customer actions; everybody must sell; product planning is critical to product success; every business has a need to define its market precisely; and markets are heterogeneous, not homogeneous in character.

Higher education has done the most marketing mismanagement in the area of not putting the customer in the center of all operations, according to Fram.

- Halpern, Jonathan

Bounds for New Faculty Positions in a Budget Plan

Ford Foundation Program for Research in University Administration, Grant No. 68-267, Paper P-10. Office of the Vice President--Planning and Analysis, University of California. Berkeley. May, 1970.

The University of California considers the faculty-student ratio a principal determinant of quality. Requests made by the University for new faculty positions are based on the student-faculty ratios proposed by the University in its five-year program for each campus. Given the forecasts of student enrollments, these proposed ratios determine the required increase in faculty positions. What the ideal ratio is depends on the Regent's policy guidelines and these may change over the years. The difference between the University's request for new positions and the number approved by the state poses a difficult problem for the administration, and this paper addresses itself to that problem. It formulates and solves a mathematical model used to calculate lower and upper bounds on the number of new faculty positions allocated, over a finite planning horizon, to a multicampus educational institution. In this model the student-faculty ratios must meet certain growth rate restrictions imposed by the faculty and the administration. The initial student-faculty ratios, forecasts of student enrollments, and certain critical ratios are assumed known and given.

- Higher Education and National Affairs

AAUP Says Faculty Pay Picture Worst Since Records Kept

Higher Education and National Affairs, American Council on Education, Volume XXI, No. 18, 3-4, May, 1972.

The Committee on the Economic Status of the Profession reported that faculty compensation in 1971-72 was the "poorest for the profession" since the association began its annual surveys in 1958. The average compensation of faculty increased only 4.3% this year and the average salary on 3.6%, yielding no gain in purchasing power for compensation and a further decrease

in the purchasing power of the average salary of 9.7%. The major causes of the deterioration in recent years has been the rise of inflation and the shrinkage of funds devoted to faculty salary increases which have outpaced the retardation of price increases.

The record at individual schools is even more bleak than the average figures portray: of 1,479 institutions surveyed, 107 reported no increases in average salary, and of these, 99 reported a decrease in average salary; almost 25% of reporting institutions had increases that averaged less than 2%--less than half of the cost-of-living increase--and 55% of the institutions received less than the cost-of-living increase.

- Jenny, Hans H., and G. Richard Wynn

The Turning Point

Office of Vice President for Finance and Business, The College of Wooster. Ohio. 1972.

The authors in a 99-page report update their 1970 study, "The Golden Years," and focus on the theme that there is a worsening of the financial condition and lack of improvement in long-term expenditure trends in private four-year liberal arts colleges. While costs have escalated, income and income prospects have fallen off significantly. Jenny and Wynn base their conclusions on a study of the financial records of 48 unidentified colleges covering the period from 1959-70 through 1969-70. The report shows that the number of colleges with deficits increased from 14 in 1959-60 to 29 in 1969-70 and that an average surplus of about $27,500 changed to an average deficit of nearly $150,000 by 1969-70. They warn that the "moment of truth" is nearer at hand and recommend that a modest increase in the student-faculty ratio would have long-range beneficial effects and that proper long-range planning requires that adequate reserves in current dollars be built up for capital consumption and replacement.

- Lamson, Robert D.

Program Classification Structure Builds Common Frame for Discussion, Analysis

Higher Education Management, National Center for Higher Education Management Systems at Western Interstate Commission for Higher Education, Volume II, No. 2, 1972.

This is a general review for the need for a common and generally accepted framework and set of definitions of "language" for institutions to be able to exchange information and analytical developments in a mutually beneficial way. The answer proposed by Lamson is the acceptance and use of the Program Classification Structure (PCS) together with the Data Element Dictionary, both developed by the NCHEMS at WICHE, in order for colleges and universities to improve their resource management allocations and to exchange comparable data relevant to planning and evaluation. The PCS is a flexible tool where the fundamental unit is the "program element," which

represents the smallest unique collection of resources that are output-producing activities, and which permits a "crossover" analysis that involves a mapping of institutional program elements into the PCS. The PCS is intended to assist decision-making in higher education and provides a vehicle for viewing comprehensively the broad range of activities at an institution of higher education by offering an outcome-oriented perspective for long-range planning by the use of modern management tools.

• McCarthy, Joseph L., and David R. Deener

The Costs and Benefits of Graduate Education: A Commentary with Recommendations

The Council of Graduate Schools. Washington, D.C., March, 1972.

This reports sets forth part of the results of the Gradcosts Study jointly sponsored by CGS and NACUBO. The results and objectives of these studies are summerized elsewhere in this bibliography. The study was completed in two phases: the collection and structured analysis of the literature, performed and reported by Lamson and Powel in two volumes entitled Elements Related to the Determination of the Costs and Benefits of Graduate Education and An Annotated Bibliography of Literature Relating to the Costs and Benefits of Graduate Education; and, the preparation of this Commentary with Recommendations. The Powel-Lamson documents show that the literature review left some of the most important problems unanswered and the McCarthy-Deener paper was authored to comment on these and other issues and to make recommendations on some of the key points.

Among their conclusions and recommendations are: the graduate degree program is the appropriate unit for consideration of the costs and benefits of graduate education; the primary output from a degree program is master and doctor degree recipients, and auxiliary outputs are new knowledge, public service, intrainstitutional influences and other entities; benefits and values perceived in the outputs accrue to graduate students, to the public and society (including taxpayers and donors), and to other units in the institution; the costs of a graduate degree program, regardless of the sourse, are defined as all monies used to provide the overall experience offered to students within the degree program; the costs of research, wholly or in an appropriate part, should be included as parts of the costs of the degree program when they involve faculty and/or students and are related to the academic program; indirect costs are those associated with support programs required for the degree program and can be allocated by identifying and developing "proxies" which appear to be proportional to the elements of costs in the program; and the total costs of graduate degree programs on an illustrative basis, except for a few costs estimates found by Powel and Lamson, are not available because of the lack of suitable procedures, basic definitions, and comparable data.

- Powel, John H., Jr., and Robert D. Lamson

An Annotated Bibliography of Literature Relating to the Costs and Benefits of Graduate Education

A Study Sponsored by the Council of Graduate Schools and the National Association of College and University Business Officers. The Council of Graduate Schools. Washington, D. C. March, 1972.

Prepared in conjunction with the Gradcosts Study, this bibliography resulted from the comprehensive nation-wide survey of the published literature and other available information (over 2,000 references) on the costs and benefits of graduate education. The Bibliography represents a selective distillation and summary, with comments, of the literature deemed to be appropriate and critical to this broad subject. It is a companion piece and extension to the corollary document authored by Powel and Lamson, entitled Elements Related to the Determination of the Costs and Benefits of Graduate Education. The subject matter is presented under four broad headings: The Economics of Higher Education, Outputs and Benefits, Inputs and Costs-General, and Inputs and Costs-Measurement.

- Powel, John H., Jr., and Robert D. Lamson

Elements Related to the Determination of Costs and Benefits of Graduate Education

A Study Sponsored by the Council of Graduate Schools in the United States and the National Association of College and University Business Officers. The Council of Graduate Schools. Washington, D. C. March, 1972.

This report is one of the three documents resulting from the joint Gradcosts Study. It is a structural analysis of the literature and develops the conceptual framework used to analyze cost studies and data.

Information concerning the costs of graduate education has appeared in the literature beginning at least in the 1890's ahd has continued since at an increasing rate. Higher education has not usually been regarded as an economic process and although the various inputs, outputs and benefits have gradually become more clearly identified, there is far from general agreement on, or acceptance of, ways to measure and evaluate outputs and benefits. The literature reveals very little in a specific sense with respect to costs and procedures for estimating the costs or benefits of graduate education.

Costs, according to the review, may be considered with respect to the public or society, the graduate student, or the academic institution. Five types of costs studies appear in the literature: simple output studies, direct cost studies, full cost studies, general systems analysis studies applying simple statistical techniques, and total systems analysis studies employing complex models and equations. The literature commonly acknowledges that there are substantial interactions among activities within departments producing primary outputs in addition to interactions among support programs;

four techniques are reported for determining the proportion of research costs which should be allocated to instruction.

Direct and indirect costs are defined and the methods used to identify and allocate these are reviewed. Faculty salaries, the major element of the direct costs of graduate work, can appropriately be allocated at present only by faculty activity analysis, and the authors present a classification scheme which is a composite of those reported. Procedures for allocating indirect costs are of three types: allocation of all indirect costs to instructional outputs only, allocation of each separate type of support cost directly to each of the final outputs of the department, and allocation by the "recursive" method. All procedures require identification of "proxies" and estimating and applying appropriate numerical relationships between the proxies and the subject activities. The authors describe a matrix presentation useful in analyzing and visualizing the allocations, and they recommend the recursive procedure for detailed cost studies; but for most applications, professional salaries appear to be the preferred proxy if a single parameter is to be chosen.

The entire literature reviewed showed only 35 actual cost studies containing data relative to graduate education, but only four of these contained usuable data by discipline and level of graduate education. Although illustrative costs data ranges are given for master's and doctors programs in 11 disciplines, it was concluded that reliable illustrative total costs of graduate degree programs by discipline, by level, by type of institution, or by apparent quality of the program, are simply unavailable at present. Further studies are recommended using uniform cost principles and procedures.

- State University of New York. Washington Office. Rowan A. Wakefield, Project Director

<u>Sources of Federal Support for Higher Education: Experimental Systems for a National Information Network</u>

Final Report for Research Foundation Project Grant No. 15-26B. The Research Foundation of The State University of New York. Albany, New York. 1968.

This report is concerned with the design and operation of an effective storage and retrieval system for the dissemination of information on federally-financed programs providing assistance and support for the many objectives of colleges and universities. The basic areas covered are: information needs of individuals, groups, and administrators in the university community and, in particular, the State University of New York; "outputs" available from federal agencies for use as "inputs" to an automated retrieval and dissemination system; analysis and availability of computers and computer programs; and the kind of communications network envisioned for the State University of New York.

To implement the investigation, studies were made of 19 campuses, 40 federal agencies, and such private organizations as Systems Development Corporation, IBM, and Xerox. A prototype experiment was devised and designs

for three experimental systems of information dissemination were suggested. It is concluded that these designs are well within the scope of existing technology. The importance of the development of a sophisticated and efficient system for disseminating machine-readable information on personnel as the "unseen colleague," programs, grants, and other activities of interest to universities is emphasized. Every effort was made to design a system responsive to the human needs and not just technologically commendable. Statistical data and a good technical bibliography are given.

- Wagner, W. Gary, and George B. Weathersby

Optimality in College Planning: A Control Theoretic Approach

Ford Foundation Program for Research in University Administration, Paper P-22. Office of the Vice President--Planning, University of California. Berkeley. December, 1971.

This is one of the continuing series of reports sponsored by the Ford Foundation Research Program in University Administration at Berkeley. In the paper the authors argue that the decision structures of educational institutions are multi-level, multi-decision-maker hierarchies which can be described and analyzed in decision theoretic therms and that these multi-level, multi-decision-maker hierarchies can be reduced to equilavent one-level, one-decision-maker formulations, which can be solved either analytically or numerically by the techniques presented. Illustrative examples are given which identify and then solve for a set of optional resource allocations and policy decisions. The computer program used for the problem and the input data specifications are included in an Appendix.

- Weathersby, George B.

Student Tuition Models in Private and Public Higher Education

Paper presented at the 38th National Meeting of the Operations Research Society of America, Detroit, Michigan, October 28-30, 1970.

This paper presents a mathematical model for use in determining student tuition charges at public and private institutions. This model treats higher education as an economic commodity, with the price to the consumer--in the form of tuition--as an algebraic function of supply, demand, and quality. The model provides one set of solutions to such problems as the optimum size and the pricing policy of private institutions, the pricing policies associated with various public objectives, and the extent to which the public sector should subsidize higher education. The model, which is simple and abstract, offers no definitive answers, but does provide a framework for the creation of a rational pricing policy for higher education.

STRUCTURES AND FUNCTIONS

- Alderman, Jeffrey D.

  The Consortium: Cooperation Can Pay Off

  College Management, Volume VII, No. 6, 14-15, June, 1972.

  The growth of cooperative relationships, mainly as a defense against rising costs, is increasing in higher education, and it seems to parallel the development of conglomerates in American business and primarily for the same reasons: stability and independence. The author points out that, although the consortium concept seems simple and appealing, there are many problems attending successful implementation. Geographical closeness and the desire or necessity to share facilities, faculties, courses, and joint purchasing resulting in savings are motivating forces. The author mentions at least 65 legal constituted consortia--formal partnerships or associations now in existence and whose members include both public and private, and two-year and four-year institutions. The Long Island Consortium, the Boston Consortium, the Middle Atlantic Consortium of Universities on Air Pollution, Associated Universities, Inc., and others are cited as representative of the diversity of the various alliances now in operation.

- Cameron, Donald F., and Peggy Heim

  How Well Are They Paid? Compensation Structures of Professional Librarians in College and University Libraries, 1970-71

  The Second Survey. Council on Library Resources, Inc. Washington, D. C. February, 1972.

  The statistics of the second survey again confirm the pyramidal structure of the library profession, which is most pronounced in universities where only 7% of the professional librarians have an average compensation in excess of $14,000. This is contrasted to university faculties where about 50% of the faculty hold ranks of associate and full professor with average compensations of $16,000 and $21,000, respectively. Library staffs in four-year colleges and in private and church-related colleges show a large percentage of department heads in relation to the total staff, and they receive lower compensations than librarians with no administrative obligations in large university libraries. The number of professional librarians in the curator-bibliographer-specialist category in universities shows an increase this year--from 7 to 12%. These specialists are not rewarded generously; their salary is about $13,000, or about the same paid assistant professors and library department heads. The outlook projected for the future is dismal in terms of attracting bright young people into

the profession. The average salary increases for librarians this year over last ranged from 5% to slightly over 7%, which about kept pace, on the whole, with the increase in the cost of living. There are several potential ways of modifying the structure and organization of the profession; the two having the greatest possibility to stimulate new and imaginative thought are a new administrative trainee track and promotion of the specialist classification. There is need for library leadership to assume a more active role in the educational process by upgrading the professional image by obtaining higher salaries.

- Dickey, Frank G., and Jerry W. Miller

  Federal Involvement in Nongovernmental Accreditation

  Educational Record, Volume LIII, No. 2, 138-142, Spring, 1972.

  The authors examine the role the government plays in accrediting institutions. They point out that if accrediting agencies continue to seek federal recognition or willfully serve governmental purposes, increased federal control must be expected. Yet, if the agencies decline to serve government, they may be charged with social irresponsibility. The authors attempt to determine where the line should be drawn.

- Graduate Record Examinations Board

  Graduate Programs and Admissions Manual

  GRE Board Newsletter, No. 10, 2, March-April, 1972.

  The CGS and GRE Board plan to publish jointly a document entitled "Graduate Programs and Admissions Manual" in the early fall of 1972. The manual will include institutions awarding a master's degree or higher in one or more fields, and who completed and returned the data collection forms sent to them early in 1972. Over 500 of these institutions appear in one or more volumes of the manual. Divided along disciplinary lines, the four volumes are: Biological Sciences, Health Sciences, and related fields; Arts and Humanities; Physical Sciences, Mathematics, and Engineering; and Social Science and Education.

- Silvert, William

Accreditation of Physics Graduate Programs

Unpublished position paper requested by the Economic Concerns Committee of the American Physical Society. Physics Department, University of Kansas. Lawrence. 1972.

The author of this paper assumes that more persons will desire to enter the field of physics than will be able to find employment in this field. The question is how and at what stage in their careers should some of these prospective physicists be "deflected" from their chosen field. A case is made for this decision being made at the point of entrance to graduate school, and the problems and difficulties with reducing graduate admissions are discussed. In order to reduce admissions, it is suggested that an accreditation board be established under the supervision of the American Institute of Physicists. Among the criteria suggested for this accreditation would be faculty student ratio, competence of the faculty, and research productivity. Certain programs are listed which might receive special consideration with regard to innovations and specific student groups. Several alternative methods of using the faculty-student ratio are discussed. Specific oppositions to program accreditation are cited and defenses described.

STUDENTS AND STIPENDS

- Federal Interagency Committee on Education

Predoctoral Fellowships and Traineeships

U. S. Government Printing Office. Washington, D. C. 1972.

This brief report lists, updates, and compares figures for the 1970, 1971, and 1972 fiscal years on fellowship and traineeship grants provided by federal agencies. The total dollars awarded have, in general, decreased by $59,368 during the three-year period; the only exceptions are increased expenditures by the U. S. Office of Education and The Environmental Protection Agency in amounts of $35,016 and $1,434 by the two agencies, respectively.

- Fontaine, Thomas D.

  Prospects for Graduate Student Support from Federal Funds in the '70's

  University of Florida Graduate School Review, Volume XIII, April, 1972.

  The author, the former Deputy Assistant Director for Education of NSF, presents his views as to the outlook for the federal support of graduate students in this decade. He traces the steady decline from the peak in number of graduate students receiving federal fellowships and traineeships of about 51,000 funded at $257.5 million in 1967-68 to about 27,600 supported in the academic year 1971-72 with funds of $136 million; the number and funds, he believes, will drop further to about 18,000 and $92 million in 1972-73. Thus, overall from the peak there will be some 33,000 fewer students supported by these mechanisms in 1972-73 and a loss of $165 million in federal funds to students and universities. Fontaine predicts that the crunch in 1972-73 will worsen for academic year 1973-74, with only 8,000 students supported by fellowships and traineeships, or a return to the 1960-61 federal support level.

  It is Fontaine's view that the alleged present surplus of scientists and engineers oand the attendant employment problem did not precipitate the cuts in direct graduate student support; but what has happened nationally is, essentially, to wipe out the direct graduate student support programs with a shift in philosophy--that the number of students to be supported in the future should be more closely tied to research funds where graduate students are expected to work for their support. If sufficient research funds are made available, more reliance will have to be placed on RA's funded from research grants and contracts and from training grants as the primary support mechanism for graduate students from federal sources. The result will be that future graduate students will go where research money is available. Those university department and faculty which have developed research capabilities and are willing to adjust to more interdisciplinary research will command the support available for graduate students.

- Holmstrom, Engin I., and Laure M. Sharp

  Study of NDEA Title IV Fellowship Program: Phase II

  Bureau of Social Science Research, Inc. Washington, D. C. July, 1970.

  This report summarizes findings of the second phase of a study designed to evaluate how well the NDEA Title IV Graduate Fellowship Program has achieved one of its stated objectives: to increase the number of well-qualified college and university teachers by providing up to three years of financial aid to doctoral students preparing for academic careers. Responses to questionnairs mailed to graduate students who received the NDEA Fellowships starting in the 1960-61 and 1961-62 academic year and to a group of "comparable" graduate students form the basis of this report. The results indicate that the program has been fulfilling its sponsors' objectives. A sizeable majority of responding NDEA Fellows completed the

doctorate and entered full-time employment as college or university teachers. Moreover, these NEDA Fellows required less time than did other graduate students to complete the doctorate. Even those without the doctorate had contributed to program objectives in that nearly half were employed in academic institutions. This survey supplements findings of the first phase of the study which was based entirely on secondary data.

- National Science Foundation. Division of Science Resources Studies

Graduate Student Support and Manpower Resources in Graduate Science Education, Fall 1970

Surveys of Science Resources Series NSF 71-27. United States Government Printing Office. Washington, D. C. 1971.

Federal support for graduate traineeships and fellowships has declined sharply in the last few years and this loss has not been offset by federally-sponsored research assistantships. Between 1969 and 1970, full-time graduate enrollment dropped less than one percent (although first-year graduate enrollment dropped by almost 3.5%). Over the same time period, federally-supported traineeships and fellowships decreased by slightly more than 11%, and the number of research assistantships supported through federal projects decreased almost 3%. During the same period, traineeships and fellowships supported by institutions and state governments declined by only slightly more than 0.5%, but teaching assistantships largely funded from nonfederal sources increased more than 4%, as did the number financing their own graduate education. Between 1967 and 1970, the number of federally-sponsored U. S. citizen trainees and fellows dropped from 26,536 to 21,087 and federally-funded RA's dropped from 13,891 to 11,844. Institutional-and state government-supported TA's increased from 21,759 to 23,502 and the number of graduate students supporting themselves increased from 13,477 to 17,678.

Between 1969 and 1970, first-year graduate enrollment in engineering increased 4.3%, but declines were experienced in all other fields (life sciences--2.2%, mathematics--4.5%, psychology--4.9%, social sciences--7.2%, and physical sciences--9.3%). For students beyond the first year, increases were shown for psychology--4%, mathematics--1.5%, life sciences--1.3%, and engineering--0.8%; social sciences decreased by 0.2% and physical sciences by 2.1%.

CHANGING FEDERAL SUPPORT POLICIES

- Abelson, Philip H.

Federal Support of Graduate Education (Editorial)

Science, Volume CLXXV, No. 4025, 947, March 3, 1972.

Abelson notes that in principle the U. S. government has at its disposal the resources of men and money to attain great and worthy objectives, but rarely does the government come anywhere near achieving its potential. Some of the worst failures come from the inability to pursue steady, consistent policies over the long term and he cites as a classic example the

harmful consequenses of recent governmental actions on graduate education.

During the early 1960's many universities were encouraged to increase the output of their graduate schools, and made large expenditures to provide expanded facilities to accommodate the federally-sponsored fellows and trainees. When the cutback in the flow of federal funds occurred, many of the private universities, being over-committed, were highly vulnerable and almost all incurred large deficits. Particularly painful to the Cartter-rated schools was the drop in fellowship and traineeship programs when funds in 1971 for such support decreased to about a third of the 1967 level. As a result, the highly Cartter-rated schools as a group (such as Harvard, Yale, Princeton, Stanford, Wisconsin, Berkeley, and the University of Washington) were forced to reduce their graduate enrollments significantly (up to 35%) in 1971. Enrollments in the "non-Cartter" schools have been increasing at the same time, and Abelson laments that an important consequence of the cuts in federal funds has been a change in patterns of higher education in the sciences to the extent that fewer students are now attending centers of excellence. Most of the best schools report that they have been able to place their new Ph.D.'s, but the big drop in recruitment has occurred at the lower-ranked schools. Abelson concludes that federal meddling in higher education has weakened many of our best universities, and capricious action in withdrawing fellowship support can only result in a lowering of the quality of American science.

- Brookings Study Group. Charles Schultze, Study Director

Setting National Priorities: The 1973 Budget

Brookings Institution. Washington, D. C. 1972.

In its third annual examination of the federal budget, the Brookings Study Group headed by Charles Schultze predicts that although the prospect for balancing the federal budget within the next few years is gloomy, major changes in financing elementary and secondary education are almost surely going to be made in the next decade, and the federal government will play a significant role for which federal tax increases will be needed.

They conclude that although the relatively "small" amount of money in this year's budget for education does not justify a separate chapter in their book, President Nixon's two major educational proposals could profoundly affect the shape of the budget over the next several years. The first of these is the promise of a "revolutionary" new school finance program to replace the property tax; the other is new federal legislation aimed at improving school opportunities for the disadvantaged. Passage of the Higher Education Bill (subsequent to publication of this analysis) could also possibly exert a significant influence on the budget and on higher education.

- Campbell, Roald F., and William L. Boyd

  Federal Support of Higher Education: Elitism Versus Egalitarianism

  Theory into Practice, Ohio State University, Volume IX, No. 4, 232-238, October, 1970.

  The authors believe that the debate on the role of the federal government in the support of higher education has been an argument between the issue of elitism versus egalitarianism. Positions on this issue, the authors feel, have affected attitudes toward the allocation of federal funds both to institutions and to students. The two fiscal manifestations of the two abstractions are defined as: firstly, a "full-cost" system of finance in which institutions charge high tuition and students obtain guaranteed loans. Secondly, opposed to the full-cost system is the low tuition, "public education" model which American public institutions have traditionally followed and which relies heavily on state and federal subsidies and private donations. The authors identify the former with the Nixon administration and the latter with The Carnegie Commission on Higher Education. After an analysis of the historical experience with federal support, the authors offer their support to egalitarianism and the "public education system."

- Kennedy, Thomas J., Jr., et al.

  Factors Contributing to Current Distress in the Academic Community

  Science, Volume CLXXV, No. 4022, 599-607, February 11, 1972

  The growth of the NIH extramural program from 1960 to 1970 is analyzed by the authors in an attempt to explain the disproportion between the recent variations in NIH funds for biomedical research and the stress and perturbation currently experienced throughout the academic community. While the total budget for research, measured in current dollars, remained about level for FY's 1967 to 1970, the amount of research supportable with these dollars declined considerably, especially for salaries of professional personnel carrying out the research. The leveling off of biomedical research funding coincided with a potential for research performance, attributable to an increase in the number of scientists and institutions granting the doctoral degree and an expansion of the scope of problems viewed as appropriate for support from public funds. The sheer magnitude and complexity of the NIH budget and the logistics of managing it have occasioned year-to-year and institute-to-institute vagaries, the impact of which becomes most apparent when operating in conjunction with budget restrictions.

  In epilogue, the FY 1971 and 1972 budgets indicate that a reversal of the trends which characterized the latter part of the 1960's has begun; changes appear to be specific, not general, and all of the variables of recent years must be considered in meeting the detailed impact of the budget increases anticipated for FY 1972.

- Kidd, Charles V.

  Federal Support for Graduate Education Reexamined

  Educational Record, American Council on Education, Volume LI, No.4, 339-346, Fall, 1970.

  This article, adapted from an address at the CGS Graduate Dean's Workshop in August 1970, expands the earlier paper. Kidd reviews the rapid expansion of the 1960's, which he describes as a golden decade for financing higher education, as a prelude to the abrupt current reversals characterized as a "period of skeptical probing and tight budgets." This situation is projected to continue for the indefinite future for at least five reasons: the high cost of graduate education continues to rise and the federal government is seriously questioning why the money is needed in terms of what the nation gains from the support; the soft-job market for Ph.D.'s in most fields is widely cited as the overriding reason to reduce graduate student support; federal support for academic research is leveling off and declining and hence the decreased need to train researchers; all higher education, including graduate education, is being critically examined; and the fundamental issues in financing higher education are now the subject of a continuing national debate.

  The rationale for OMB's case for loan support in lieu of stipend support for graduate students is described but the uncertain future for loans is cited as epitomizing the need for an advisory mechanism for higher education at the center of the executive branch to avoid errors and to ensure that appropriate alternatives are considered.

  The author concludes that federal support for graduate students is presently undergoing a fundamental reexamination and cites the need to establish an optimum stable level of federal support for graduate students, such as the FY 1970 level, with cost of living increases of about 5% to compensate for inflation. The most serious block to accomplish a federal policy and plan is the present structure of Congressional Committees.

- McConnell, T. R.

  Accountability and Autonomy

  Center for Research and Development in Higher Education, University of California. Berkeley. February, 1971.

  In the last few years government agencies have expanded their controls over higher education and thus diminished the autonomy of public institutions Some of the recent instances of government intervention were the responses of legislators and government officials to student and faculty behavior that they considered irresponsible and disruptive. In other cases, financial stringency and mounting costs have provoked greater controls, indicative of long-range trends in government and public administration. In any event educational institutions have found themselves accountable in manifold ways to the agencies of state government. As private colleges and universities secure state support, they too will find themselves publicly accountable.

And as federal support of higher education grows, both public and private institutions, will find themselves increasingly accountable to the federal departments that administer the funds as well as to the state agencies through which they are channeled.

- National Science Foundation

Federal Support to Universities, Colleges and Selected Nonprofit Institutions, Fiscal Year 1970: A Report to the President and Congress

U. S. Government Printing Office. Washington, D. C. July, 1971.

This report is the third in a series of annual reports to the President and Congress on current patterns of federal funding of research, development, and other science-related activities at universities, colleges, and other nonprofit institutions. The various categories covered in the report are: trends in federal support to universities and colleges; total program activities; federal obligations for academic science; federal obligations for research and development; federally funded research and development centers administered by universities and colleges; federal support to idependent research institutions; and federally funded research and development centers. Three concluding appendices contain technical notes, statistical tables, and information regarding federal obligations to two-year institutions.

- Reitz, J. Wayne

The Outlook from the Federal Government

Proceedings of the Tenth Annual Meeting. James N. Eshelman, editor. Council of Graduate Schools in the United States. Miami Beach, Florida. 28-33. December 2-4, 1970.

This paper discusses the trends in federal support for doctoral education from 1960-1971. The peak of federal support was in 1968-69, with funds for fellowships decreasing significantly in the ensuing years. Because of cuts in federal R&D expenditures, many of the new doctorates are no longer as easily absorbed by the job market as in previous years. This situation has caused many departments to limit their admission of new graduate students, and has discouraged institutions from launching new doctoral programs. Because of a continued decrease in federal support, many institutions may have to eliminate some existing doctoral programs, and serious questions are being asked within the federal government about the worth and effectiveness of continued support for advanced education. High priority areas will probably be the following: assisting the disadvantaged; support for fields where a deficit exists, such as the environment, transportation, and urban studies; strengthening the quality of graduate programs by geographic areas; and some non-categorical support for institutions. Notwithstanding these priorities, present support levels for fellowships and traineeships, though much reduced, will probably be maintained during the next few years.

- Young, M. Crawford, and Robert M. Bock

  Hard Times for the Graduate Schools

  Change, Volume III, No. 4, 20-22, Summer, 1971.

  This paper extends and elaborates upon the title theme, using the University of Wisconsin as the example; Bock had previously reported on this topic. They review the general response of graduate programs, and the biomedical fields in particular, to the prospect of contraction and conclude that remarkable adjustments have already occurred by cutbacks in enrollments at the major institutions, including Wisconsin. The authors argue that although beneficial as a supplementary source of support, sole dependence upon loans is a threat to the survival of quality graduate education, and they express the hope that when the decisive moment comes, the federal government will not liquidate entirely its assortment of graduate fellowship and traineeship programs. Otherwise the whole superstructure of graduate education may be dismantled on the basis of uncertain evidence of forecasts of castastrophic oversupply in the 1970's, which the authors contend are greatly exaggerated.

SUPPORT AND FUNDING: FEDERAL (R&D AND STANDARDIZATION OF FINANCING); PRIVATE FOUNDATION PROGRAMS; STATE SUPPORT

- American Association of Fund-Raising Counsel

Giving U. S. A.

American Association of Fund-Raising Counsel, Inc., New York. 1972.

Total U. S. philanthropy reached $21.15 billion in 1971, of which $3.3 billion was given to education according to the 1972 edition of the publication, Giving U. S. A. Although gifts to education increased 6.5% over 1970, education's share of all philanthropy dropped slightly--to 15.6% of the total. Individuals contributed $15.1 billion of the total--up 4.9%; bequests were $3 billion--up 36%, foundations gave $2.05 billion--up 7.9%, and cooperations showed no change at $1 billion.

The report noted indications that private philanthropy will grow in the years ahead; foundation gifts spurred by payout requirements of the new federal tax laws seem likely to increase, and bequests, if they continue the trend of recent years, will also rise substantially. The report lists the largest foundations by latest assets and 1971 grants made, and notes that the new Robert Wood Johnson Foundation, with a $1 billion bequest, will add from $45 to $60 million a year to the total of the foundations' gifts; the Johnson Foundation will rank next to the Ford Foundation in total assets. The report predicts that some foundations will begin to support ongoing programs rather than just supporting innovative and initiative grants; both Ford and the Johnson Foundations are believed to be inclined in this direction.

- American Council on Education

50 Colleges Show a Large Increase in 1970-71 Giving

Higher Education and National Affairs, Volume XXI, No. 27, 4-5, July 14, 1972.

A survey of 50 colleges and universities, conducted by the Brakeley, John Price Jones Company of New York, show that they received an all-time high of $590 million in voluntary support in 1970-71, an increase of 5.2% over the previous year. The 50 institutions reported $166 million in bequests compared to $89 million the previous year, the largest annual increase ever reported in the survey. Of this increase, $65.8 million or a 200% increase was reported by five institutions: University of California, Harvard University, MIT, Princeton, and Yale. The other 45 institutions attained a 20% gain in bequests. In contrast, the survey found a 10% decline in gifts and grants from living individuals, corporations, and foundations.

- American Council on Education

  Germany and Japan Form Foundations for Foreign Studies

  Higher Education and National Affairs, Volume XXI, No. 27, 1-2, July 14, 1972.

  The governments of West Germany and Japan announced separately in June the establishment of multi-million dollar foundations to support studies of interest and concern to their two countries and the United States. The German Marshall Fund was announced by Chancellor Willy Brandt at the Harvard University convocation commemorating the 25th anniversary of the Marshall Plan and will receive about $3.1 million annually over the next 15 years from the German government. The fund will promote comparative research on industrial societies, support the study of problems of international relations common to Europe and the U. S., and provide support for the field of European studies. A total of about $1 million of the funds is earmarked as an endowment in support of the West European Studies program at Harvard.

  Ambassador Ushiba announced the Japan Foundation at a conference in Washington and said it will become effective in October, will begin with an initial fund of $32 million, and is expected to grow in the future, with increasing contributions from both governmental and nongovernmental sources. The Japan Foundation will place particular emphasis on personnel exchange and Japanese studies in the U. S. The Japanese Language Center in Tokyo, a consortium of American and Canadian universities, will be supported and the Foundation has already begun granting scholarships to American scholars engaged in Japanese studies.

- Brennan, Michael J.

  The Dismal Outlook for Graduate Education

  Brown University. Alumni News, 1972.

  Brennan reviews the factors contributing to the rapid expansion and favored position of graduate education and research following WW II and the events in the late 1960's causing the abrupt reversal of the expansionist machinery. He pessimistically concludes that graduate education has now fallen on evil days; he especially focuses upon the severe effects the elimination or drastic reduction of federal programs has had on direct graduate student support and cites figures for Brown as an example. Several reasons are responsible for the change in federal policy, but the reported oversupply of Ph.D.'s and the reduced opportunity for their employment has led to a public policy which damages the very best institutions and thereby the overall quality of graduate education in America. The response in the more prestigious graduate schools (Harvard, Princeton, Yale, Stanford, Brown, Berkeley, Wisconsin, etc.) has been to reduce graduate enrollments from 20 to 35%. In contrast, national totals are still on the upswing, largely in the developing and weaker schools, which are mainly insulated from the effects of recent federal and foundation policies. The top 30-40 institutions are limiting the size of their graduate schools not primarily because they cannot place their Ph.D's in appropriate employment, but because they cannot

provide the resources formerly coming from outside funds. The author lists three convincing reasons why it is unwise to admit students without offering support and why graduate students in the arts and sciences will not finance their own education. Austerity does not encourage reform and innovations needed and reallocation of support will discourage renewal in those very places with the staunchest roots in excellence. Concluded that unless new ways are found to preserve past accomplishments and selectively encourage innovations of lasting worth, the outlook for quality graduate education in the future is dismal.

- The Carnegie Commission on Higher Education

The Capitol and the Campus: State Responsibility for Postsecondary Education

McGraw-Hill Book Company for The Carnegie Commission on Higher Education. New York. April, 1971.

Based on the general theme and the papers given at a Conference held by the Center for Research and Development in Higher Education and the Western Interstate Commission for Higher Education in 1966, this report examines the state's responsibility for the postsecondary education of its citizens. It reviews and makes recommendations for state planning and coordination, for state financing, and for problems of public accountability and institutional independence in the context of state financial support for both public and private sectors. The two general recommendations of the Commission are: first, states having a ratio of less than 30 places in both public and private higher education in the state for every 100 eighteen-to-twenty-one-year-olds in the state should take emergency measures to increase the availability of higher education in the state, and second, states with a present expenditure of less than 0.6 percent of per capita personal income spent through state and local taxes for higher education should take immediate steps to increase their financial support of higher education.

- Chambers, M. M.

Appropriations of State Tax Funds for Operating Expenses of Higher Education 1971-72

National Association of State Universities and Land Grant Colleges. Washington, D. C. 1972.

This paper presents the 12th annual "Chambers Report" on state tax appropriations for operating expenses of higher education. The 1971-72 survey shows that state appropriations to the principal state universities across the nation have not kept pace with the rate of growth of increases in overall state allotments for higher education. The result of this will be, unfortunately, that students will be the new source of funds for the institutions. Tuition increments have been rising steadily over the years, and as the state appropriations decrease in proportion to costs, tuition will rise even higher.

- Federal Interagency Committee on Education. Student Support Study Group

  Report on Federal Predoctoral Student Support: Part II - Students Supported Under Training Grants of the National Institutes of Health and the National Institute of Mental Health

  Federal Interagency Committee on Education. Washington, D. C. April, 1971.

  This report presents data concerning predoctoral students supported under training grants of the National Institutes of Health and the National Institute of Mental Health. The report offers a discussion of the training grant and a comparison of it to other forms of support, a discussion of the students and the fields of study supported under training grants (biological sciences, social sciences, and health professions), and a comparison of NIH and NIMH trainees to all federally supported students receiving fellowships and traineeships. Also discussed are some of the proposals made for extending federal financial aid to graduate as well as undergraduate students regardless of field.

- Humphreys, Lloyd

  The Role of the National Science Foundation in Graduate Education

  Proceedings of the Tenth Annual Meeting. James N. Eshelman, editor. Council of Graduate Schools in the United States. Miami Beach, Florida. 144-151. December 2-4, 1970.

  The National Science Foundation has traditionally supported education in the sciences, engineering, and technology through traineeships, fellowships, grants, and other awards. This year's budget will probably not allow any money for generalized traineeships; there will be a modest increase in research support, some money for fellowhips, and limited amounts for other projects. There will be some administrative changes in traineeships and fellowships, with an increase in the stipends and the abolishment of the dependency allowance. Educational costs are high because a larger proportion of the population is being educated at all levels in this country than anywhere else. There are too many Ph.D.'s and too many B.A.'s, while there is a shortage of mechanics. There is a great need to set up additional hierarchies of prestige to the verbal-intellectual one, with education focusing on occupational training with liberal arts subjects at the periphery. At the graduate level this means a need for different programs, such as programs for teachers of science and mathematics and programs for science practitioners. In its support for training programs, the Foundation will look for something other than training in the traditional disciplines and university support for applied programs will be an important factor.

- Lemonick, Aaron

  The Plight of the Graduate School: One Dean's Views

  Princeton, New Jersey. February, 1972. (Mimeographed.)

  Dean Lemonick examines the impact of fiscal restraints on students and graduate programs in general, and at Princeton University in particular.

  The heart of his paper focuses on the grim fact that graduate schools are feeling a sharp, shock wave-like decrease in graduate support funds from outside sources, mainly caused by reduction or termination of federally funded programs. This massive curtailment in support threatens to do long-term injury to graduate schools and the quality of graduate education in the nation, particularly at the established schools which have already significantly reduced the size of entering classes and are faced now with the problem of discontinuing entire Ph.D. programs which stands among the best.

  His arguments are illustrated by the case at Princeton, which he believes is indictive of what is happening at the quality graduate schools elsewhere; figures to support his contention are cited.

- Sharp, Laure M., et al.

  Study of NDEA Title IV Fellowship Program: Phase I

  Bureau of Social Science Research, Inc. Washington, D. C. March, 1968.

  This report summarizes the findings of the first phase of a study designed to provide an evaluation of the NDEA Title IV Graduate Fellowship Program in regard to its stated objective of increasing the number of college and university teachers by assisting doctoral students preparing for academic careers. It is based entirely upon secondary analysis of available data and consists primarily of statistical tables with only a brief summary of the major findings. These data suggest that while the award of the fellowship per se did not develop a strong sense of commitment to completion of the doctorate among all awardees, those who received the fellowship for three years and obtained their degree had a strong teaching commitment, even in fields where alternative sources of employment were plentiful.

- Shulman, Carol H.

  State Aid to Private Higher Education

  American Association for Higher Education for the ERIC Clearinghouse on Higher Education, The George Washington University. Washington, D. C. June, 1972.

  This review of recent literature, with an annotated bibliography, examines plans for new forms of state aid to the independent sector and the

state's interest in aiding private colleges; a list of current state programs for private institutions is included in an Appendix.

The survey indicates that although public assistance alleviates the private colleges' financial problems, and it may be the only visible means for survival of some, it also obligates them to increased state supervision of their activities. Various ways of maintaining an independent sector through student and institutional assistance exist in a total statewide system of higher education, but support and opinions about control and autonomy are seldom in agreement.

- Stever, H. Guyford

We're the Agency to Guard the Basic Research End of the Spectrum

Mosaic, National Science Foundation, Volume III, No. 2, 16-21, Spring, 1972.

In the National Science Foundation (NSF) house organ, Mosaic, Stever as the fourth Director of NSF presents his views on a wide range of topics pertaining to NSF, higher education, and science. Some of the highlights of his observations include: the basic and unique mission of NSF is to guard the basic research end of the spectrum in ensuring the health of science in the U. S.; some sciences--mathematics, physics, chemistry, and biology--undergird the rest of the structure of science, and the other sciences are derivative sciences; NSF must ensure the balance of support of all sciences because science does not advance on a uniform front, and at the same time NSF must respond to societal pressures, but not unilaterally or completely. All activities have been under pressure in recent years, not just science; but from all of the recent upheaval we have learned that science should be responsive to the needs of society--RANN is an example of the response to national needs. General feeling is that NSF should support institutions through research programs and scientific curricula. The basic competitive graduate fellowship program has been retained and next year we expect to support a small increase in graduate students, but other support of graduate students is being shifted more to research projects. Manpower supply and how to predict needs in science is an unknown and inexact subject. The crisis of temporary unemployment is real, but we may have greatly overestimated it; it is clearly a local phenomenon in regard to certain fields and geography, and we should not overreact to either extreme of over- or underproduction.

- U. S. Department of Health, Education, and Welfare. Office of Education, by Clarence B. Lindquist

NDEA Fellowships for College Teaching, 1958-1968; Title IV, National Defense Act of 1958

U. S. Government Printing Office. Washington, D. C. 1971.

Title IV of the National Defense Education Act (NDEA), passed in 1958, was intended to alleviate an existing and projected shortage of qualified college teachers. This was to be accomplished by means of awarding three-

year fellowships for full-time study to doctoral candidates interested in college teaching, by institutional allowances for strengthening graduate programs, and by a wider geographical distribution of strong graduate programs. This report provides a detailed legislative and administrative history of the Title IV program, including the origin of the Title IV, the conceptualization of NDEA, the hearing and passage of the act, implementation of Title IV and its history during 11 years of its operation, the loyalty oath and disclaimer affidavit controversy, and a statistical review and evaluation of the Title IV program.

- U. S. News & World Report

Campus Research: A Giant in Trouble

U. S. News & World Report, Volume LXXI, No. 25, 33-37, December 20, 1971.

Apparent reasons for the recent decline in research funding and expenditures at universities and colleges are described. The decreased funding of projects connected with national security and the increase in support of civilian programs are noted as significant trends.

HISTORY AND DEVELOPMENT OF HIGHER EDUCATION

COLLEGES AND UNIVERSITIES

- Handlin, Oscar, and Mary F. Handlin

  The American College and American Culture: Socialization as a Function of Higher Education

  McGraw-Hill Book Company for The Carnegie Commission on Higher Education. New York. 1970.

  This essay traces the historical evolution of the role of socialization as a factor in the development of the college in the United States. The authors find the religious motive as a consistently descerible factor, with the missionary urge being a specific manifestation and the ministery being the earliest field of specific training. A relationship with European universities created a professional motive for establishing institutions in America. From the beginning the community viewed the university as "useful," and the individual perceived it as increasing his social mobility. However, a nonreligious, non-vocational function emerged; that is, attendance at college was an aspect of socialization. Precisely how the process of socialization operated depended not only on the college as an institution but also upon the changing structure of the society into which the individual would move and on the changing conception the individual held of himself. These elements underwent radical alterations during the following 300 years and, inevitably, the authors conclude that change itself is the only real constant factor.

- Hobbs, Nicholas, editor

  The Prospects for Higher Education

  SNPA Foundation Seminar Books. Southern Newspaper Publishers Association Foundation. Atlanta, Georgia. 1972.

  This volume is the product of a seminar held at Vanderbilt University, July 18-22, 1971. Participants included newspapermen, educators, and publishers. The seven papers presented address three issues of importance to higher education: the relationship of the college or the university to contemporary society, and the conflicts of freedom and obligation generated therefrom, including how institutions are to be financed and governed; the impact on higher education of a radical tradition, both asserted and denied in American life, and the doctrine of equal access to opportunity for all people; and the influence on colleges and universities of two interrelated, swift-running elements in American society described as "participatory democracy" on the one hand, and as "black identity," "chicano identity," or "personal awareness" on the other. These three basic issues have a common theme that is interwoven through the presentations of the speakers--a university chancellor, a former president of a black college, a critic of

undergraduate education, a student leader, a leader in the community college movement, a director of a state commission on higher education, and the provost of the host institution.

- Kaysen, Carl

The Higher Learning, the Universities, and the Public

The Stafford Little Lectures at Princeton University. Princeton University Press, Princeton, New Jersey. 1969.

Essentially an essay, the first two chapters of the book are based on the texts of two Stafford Little Lectures for 1967-68 given in February of 1968. The remainder of the book is devoted to indicating ways in which the author would answer the main question raised in the lectures--namely, the social functions of the American University in relation to its basis of financial support.

- Roose, Kenneth

Fifty Top-Rated Institutions: Their Role in Graduate Education

Center for Research and Development in Higher Education, University of California. Berkeley. 1971.

This article analyzes some of the data collected in a survey by the American Council on Education on the quality of graduate programs in 1970. It discusses: the ratings of faculties of the 50 top-rated graduate schools compared with 80 other institutions; the number of "quality programs" in the humanities, social sciences, biological sciences, physical sciences, and engineering in the 50 top-rated graduate schools as compared with 80 others; the regional strength of the 50 top-rated institutions; and the number and percent of programs at the 50 top institutions that scored below a quality standard. The paper concludes with the suggestion that, although there are a substantial number of unsatisfactory programs offered at the top 50 institutions, these graduate schools may be more than adequate to fill the needs for traditionally trained Ph.D.'s during the decade that lies ahead.

- Snow, C. P., and Philip Snow

Hope for America

Look Magazine, December 1, 1970, 30-41.

The article, covering a broad range of topics, is the result of numerous trips by father and son to America. The senior Snow considers the contribution to knowledge made by the universities as one of the greatest American contributions to Western civilization. "At a rough estimate, since 1945, American universities have carried out about 80 percent of all the

science and scholarship in the Western world, and a very high proportion of the science and scholarship in the whole planet. That is the effort of a single generation."

ORGANIZATIONS

- Bronk, Detlev W.

  A National Focus of Science and Research

  Science, Volume CLXXVI, No. 4033, 376-380, April 28, 1972.

  This article, by the former president of the National Academy of Sciences (1950-62) and president emeritus of Rockefeller University, is based on an address delivered at the dedication of the completed building of the National Academy of Sciences in Washington, D. C., on April 26, 1971. The title of the article is identical to that of a paper written by George E. Hale, who began the building some 50 years before. Written with the insight of one intimately involved in the process, this address is a historical chronicle of the leaders of science who were instrumental in designing and implementing the building and objectives of the NAS-NRC during the last 50 years.

- Whaley, W. Gordon, editor

  Journal of Proceedings and Addresses of the Twenty-First Meeting

  Association of Graduate Schools in the Association of American Universities. New York. October 22-23, 1969.

  The Proceedings open with an editorial "Time for Change," by Dean W. Gordon Whaley who warns that unless graduate education examines not only the nature of its successes and does everything it can to enhance them, but also the reasons for the failures and alienations and does its utmost to remove them, it will be headed for extinction. This is followed by presentations given at three panel discussions: graduate education in a changing world, federal responsibilities to the university and university responsibilities to the federal government, and graduate education and the black student. Reports of the committees are included on: policies in graduate education, international education, research and research administration, student aid, and testing. The Proceedings conclude with a brief report on Association business, the Association's constitution, Association officers 1949-1970, and a list of member institutions, graduate deans, and addresses.

TRENDS IN GRADUATE EDUCATION

• Ashby, Eric

Any Person, Any Study: An Essay on Higher Education in the United States

McGraw-Hill Book Company for The Carnegie Commission on Higher Education. New York. 1971.

Ashby states that the purpose of this essay is not to weigh the relative merits of American and British universities and colleges, but to give a personal commentary on American higher education from the viewpoint of someone who is not involved directly but is nevertheless close enough to the system to understand it. The author casts his investigation around two interrelated questions: Does the system fall short of its frequently enunciated ideals and aspirations? Do the ideals and aspirations themselves need revision?

Ashby predicates his analysis on the assumption that uninhibited growth is, for the first time, coming to an end and there will arise a need to impose constraints wherein maintaining excellence without expanding becomes the goal. Two problems arise: first, in the short-term, how to finance one last expansion drive in order to remove the remaining social inequities; and second, in the long-term, how to maintain viability and still reconcile the aspirations of society to the fact that everyone can receive a degree. Regarding impressions of the systems as a whole, the author is cognizant of a wide gamut of quality in the institutions themselves; the high dropout rate; and the failure to eliminate the effects of social class upon access to higher education.

Amid dire speculations about "brontosaurian cumbrousness and a surfeit of mediocrity," Ashby epigrammatically offers three alternative routes: first, a moratorium on expansion; second, radical and total disruption; or third, evolutionary elimination of obsolete aspects. Eschewing both left and right, Ashby opts for the third course. Finally, the overriding priority in the author's view is the restoration of consensus within the academic community about the rights and responsibilities of universities in society. He feels that this can best be achieved by maintaining the dichotomy between the university and society, leaving the university free to offer advice only on matters which are directly related to it.

• Ben-David, Joseph

American Higher Education: Directions Old and New

McGraw-Hill Book Company for The Carnegie Commission on Higher Education. New York. 1972

Ben-David's observations concern not only the major trends in American higher education but also an amazing array of specifics that Americans tend

to overlook or take for granted. He believes that the balance of forces and pressures that had kept our colleges and universities going for the last hundred years has been disturbed to the extent that the traditional allegiance of some "nonscholarly" students and some teachers has been lost. The basis for this unity of teaching and research was weakened by the rapid rise of research that had little or nothing to do with teaching, and by the imbalance in rewards for teaching and for research. The sudden rise of graduate studies and of insecure and marginal communities in and around colleges and universities further contributed to societal tensions and internal conflicts. The internal problems have been worsened by the recent politicization of the campuses. He defines the current crisis and the prospective challenges as having four major components: finding alternatives to the politicalization of the campus; achieving a better balance between teaching and research--perhaps a new degree or a conscious effort by administrators not to make appointments on the basis of Ph.D.'s (or publications) as the main criteria; renovating general education for the nonscholarly and nonprofessional student by creating courses that would be a significant educational experience and divest the college of its "initiation" function to adulthood--perhaps by changing the pattern of college attendance; and reducing the impact of the "intellectual-Bohemian proletariat" on the campus by policies of making a clearer distinction between work and study among graduate students and the rechanneling of subsidies for cheap living into scholarships.

- Daniels, George H.

  Science in American Society: A Social History

  Alfred A. Knopf. New York. 1971.

  In his book, Daniels examines the historical role science has played in the United States within its institutional setting by characterizing the developmental stages by four periods: the colonial, the republican, the professional, and the imperial. He describes the ideology, and philosophy, and language of science as it evolved, and the book offers an intellectual and historical framework from which the present can be better understood by identifying the powerful sources of continuity in the past. From this setting, Daniels examines the current problems, mainly occasioned by the loss of soft money in the sciences, mathematics, and engineering, and envisages a difficult decision in determining the redistribution of hard money within university budgets.

- Gagnon, John H.

  A Review of Science in American Society: A Social History, by George Daniels

  Change, Volume 4, No. 1, 56-58, February, 1972.

  In reviewing Daniels' book, Gagnon refers to it as an illuminating work which traces the history of the development of the present status of science through four stages in which scientists are characterized as either saints or monsters. Gagnon notes that the illumination of the period before

WWI is particularly useful. The book is, in Gagnon's view, a valuable survey, well-written and intelligently presented; he suggests that it is a useful manual for nonscientists in the university who share committees with their colleagues in the sciences, and that it provides them a better understanding of science and scientists. Gagnon faults the book because of its inadequate coverage of the scientific "imperium" of the last quarter-century and because of its insufficient treatment of the role of the social and modern biological sciences.

- Graduate Record Examinations Board

  Panel on Alternate Approaches to Graduate Education

  GRE Board Newsletter. No. 10, 1, March-April 1972.

  The GRE Board and CGS are jointly sponsoring a panel to study the extent to which graduate education is meeting the needs of a rapidly changing society and to recommend future courses of action and possible new instititutions to satisfy the increasing demand for quality advanced education.

  One of the purposes of the Panel is to complement the work of the Commission on Non-Traditional Study which is emphasizing undergraduate programs. The Panel has met to define the scope of its task and formed a subcommittee to investigate what unmet needs for advanced education now exist among various populations of potential students, and to reports its findings to the Panel in June 1972.

  The Panel expects to complete the study and report its findings and recommendations to the graduate community in 1973.

- Harvard University. Faculty of Arts and Sciences.

  Report of the Committee on the Future of the Graduate School

  Harvard University. Cambridge, Massachusetts. March, 1969.

  This report deals with the Graduate School of Harvard University and focuses on the problems that have been created by the school's rapid expansion in the past ten years. Chapter One defines the scope of the report. Chapter Two examines the size of the Graduate School in terms of available resources and recommends a reduction in the number of graduate students by at least 20% over the next five years. Chapter Three deals with the admission procedures for graduate students, the availability and adequacy of financial aid, and the awarding of postdoctoral fellowships. Chapter Four discusses the problem of low morale among Harvard's graduate students; and Chapter Five discusses the special problems of teaching fellows and graders. The report concludes with a summary of recommendations.

- Kent, Leonard J., and George P. Springer, editors

  Graduate Education Today and Tomorrow

  University of New Mexico Press. Albuquerque. 1972.

  This collection of essays on graduate education was published as a Festschrift to Gustave O. Arlt. The authors are graduate school administrators from around the country, experts in their own areas of study as well as education in general. They offer factual answers and informed speculation on many questions prevalent in graduate education today. The articles cover such topics as: problems confronted by specific fields of study, future developments such as interdisciplinary programs, the Doctor of Arts degree, the need for greater attention to teaching, enrollment trends and costs, and the need to maintain the high quality of graduate education. Two articles speak of the achievements of Gustave O. Arlt and his contributions to graduate education at home and abroad. Many of the articles have been abstracted individually in this bibliography.

- Lucki, Emil

  Graduate Education in the Next Three Decades

  Graduate Education Today and Tomorrow. Leonard J. Kent and George P. Springer, editors. University of New Mexico Press. Albuquerque. 69-77. 1972.

  The pace of graduate education, the author maintains, is altered by the nation's urgent needs and priorities. The demands of producing an atomic bomb and the race after Sputnik, with all their ramifications in the academic community, will have counterparts in the next three decades in the form of problems concerning the needs of the environment, the needs of the cities and, in addition, the problems of caring for the aged and the increased amount of leisure time.

  Lucki concludes that graduate schools can expect increased enrollments and to have further expansion and some redirection in their goals toward social services. They will utilize more technological teaching techniques. They will have to face up to an increased student demand for greater concern for the good life, both from the moral and physical standpoint. They will have to allow the students a greater role in developing curricula and governance. At the same time, they will have to fend off attempts to convert them into social action agencies for the powers that be, be it the state or organized activists. Finally, they will have to try to preserve the great values of the past.

• Mayhew, Lewis B.

The Literature of Higher Education 1972

Jossey-Bass Inc., Publishers for the American Association for Higher Education. San Francisco. 1972.

The author attempts to digest and comment on the most of the books about American higher education published during 1971. From his review, Mayhew distills what he considers to be the major trends, which are summarized in Part One. The other major topics, treated in eight parts, are: Administration, Organization and Governance; Student Protest: End of an Era?; Students and their Affairs; Curricular and Instructional Concerns; Educational Opinion and Policy; Types of Institutions; Faculty and their Affairs; and History: More or Less. Part Ten consists of the Bibliographies and an Index.

Mayhew concludes that although the literature of higher education of the past year has expanded over previous years, it was of somewhat better quality (although there were few outstanding works) and reflective of fundamental changes. Student protest received considerable attention, but of a different sort than previous treatments; publications on governance and finance seemed endemic; a series of books presented broad schemes for curricular reform, and several reports dealt with curricular improvement in specific fields; liberal arts colleges and junior colleges received most of the coverage from the institutional viewpoint; and foreign-born scholars did a better job on broad philosophical statements than did native scholars. The main gaps that exist in the literature are cited: little evaluative material about reform and innovation; broad, synthesizing historical works are few; helpful works on governance are scanty; international education was not well represented; and counseling did not receive adequate attention.

Rice, Philip M.

New Models for Graduate Education

• Proceedings of the Fourteenth Annual Meeting. Western Association of Graduate Schools. Tempe, Arizona. 67-72. March 5-7, 1972.

The author explores the structural dependence of graduate schools on undergraduate schools. He reviews the pressures of financial management, job placement, and other factors on the administrators of graduate schools and the graduate dean in particular. Rice offers some recommendations; in particular, he develops the concept of regional centers of education.

- Shull, Harrison

  The Crisis of Confidence

  Paper given at the Annual Meeting of the Association of Graduate Schools, Minneapolis, Minnesota, October 22, 1971. (Mimeographed.)

  Dean Shull presents a refreshing viewpoint, in that he disagrees with many of the criticisms of graduate education being voiced currently, and also in that he believes the Ph.D. degree program to be an unusually successful one. Admitting that there are widespread symptoms of neglect and decay and that there exists a crisis of confidence in our present system, he decries the widespread, and in his opinion, mostly unfounded criticisms of universities, graduate schools, and programs, all of which come together in government attitudes. Science programs, in particular, seem to be at the center of controversy.

  Shull maintains that the Ph.D. program has been a success because: it selects the most promising of the candidates who apply and weeds out diligently those unable to make the grade; it educates those who continue in a problem-solving capability by a case-study approach involving original research in their chosen field; and, self-confidence and independence are developed within the student and carry him forward to a life-long career of continued education and creative problem-solving.

  Figures are cited that "education pays" in terms of life-time earnings which are loosely correlated with the level of education according to Census Bureau data, but more positively for Ph.D. chemists, according to American Chemical Society figures. However, the primary motivation for graduate work should not be future earning ability but the desire to learn. Further expansion of graduate schools and programs should be carefully controlled, quality should be preserved, and incentives offered for high quality programs at educational levels other than doctoral work.

- Southern Regional Education Board

  Higher Education for the Future: Reform or More of the Same?

  Proceedings of the 20th SREB Legislative Work Conference. Key Biscayne, Florida. July 14-17, 1971.

  This Work Conference, sponsored by SREB, was held at Key Biscayne, Florida, in July 1971, and the Proceedings record the papers and discussions that were given by leading educators and legislators and which center about key issues facing higher education in general. Manpower needs, postsecondary educational opportunity, the kinds of students who attend various institutions and why, the reforms needed, educational alternatives, and financing and ways to solve it--all received attention by the seven speakers on panels.

- Stanford University

The Study of Education at Stanford: Part VII, Graduate Education

Stanford University Press. Stanford, California. 1969.

This report is one of a series of special committee reports submitted to the Stanford University community for its consideration. Based on a survey made in 1968 by the Steering Committee, all Ph.D.-granting departments responded to twelve questions. A summary of the responses to these questions is given in the report. The report also includes a discussion of selected issues in graduate education, recommendations, proposals for further consideration, and an extensive appendix of the materials collected. The major recommendation is that a commission be established to study in greater depth Stanford's problems in graduate education, and it is emphasized that the report is basically a working paper. In only a few other cases, formal recommendations are made; but for the most part, proposals needing additional study and discussion by the University community are presented and resource papers are included as the starting point for further scrutiny.

- U. S. Department of Health, Education and Welfare. Office of Education

Report on Higher Education

U. S. Government Printing Office. Washington, D. C. March, 1971.

This report by a task force funded by the Ford Foundation analyzes the problems facing the nation's system of higher education in the 1970's and discusses how well the functioning of that system matches the public interest. The problems are divided in the following categories: the paradox of access, meaning that access alone does not automatically lead into a successful education; the lockstep of students in college, who are there for any reason but to get an education; educational apartheid, with the "college age" population being rather exclusionary; the homogenization of higher education; the professionalization of learning; the growth of bureauacracy; the illegitimacy of cost effectiveness; the inner direction of graduate education; the credentials monopoly; the unfinished experiment in minority education; barriers to women; and community colleges that do not fill the specific needs of their students. The remainder of the report is devoted to a discussion of steps that must be taken to remedy the situation.

- University of Maryland. The Graduate School

Graduate Education Today

Graduate School Chronicle, Volume V, No. 2, 17-19, March 1972.

In an interview, Dr. Michael J. Pelczar, Jr., Vice President for Graduate Studies and Research at the University of Maryland Graduate School, discusses a wide range of subjects relating to graduate education. He touches upon the tendency for "sameness" in graduate programs, the caution now

exhibited in establishing new graduate schools--traditional or nontraditional, the D.A. degree, over-specialization, public disillusionment with graduate education and the Ph.D. in particular, the relationship between graduate and undergraduate study, the development of postgraduate, nondegree graduate education, and the need for intensive review and discussion prior to effecting needed changes in graduate programs.

- Wilson, Logan

  The New Orthodoxies in Higher Education

  Educational Record, Volume LIII, No. 2, 157-160, Spring, 1972.

  Dr. Wilson, former president of the American Council on Education, protests what he regards as six spurious contemporary dogmas in higher education. Although favoring some drastic campus changes, he vigorously opposes "the notion that only the young can truly perceive the imperfections of this era and clearly foresee things as they ought to be."

- Woodring, Paul

  The Higher Learning in America: A Reassessment

  McGraw-Hill Book Company. New York. 1968.

  This period piece work, circa 1968, reflects heavily the influence of two earlier works, one by Thorstein Veblen and another by Robert Maynard Hutchins. Woodring sociologically surveys the institutions, the students and academic life, and "problems and proposals." The theme of the work is the disjointed and counterproductive relationship between the three main aspects of higher education: liberal education, academic specialization, and professional training. The author submits a self-proclaimed utopian remedy that "would require a reconstruction of the entire educational system from bottom to top because I am convinced that the American custom of planning each level of education separately lies at the root of many of our problems." Realizing the dim prospects of his panacea being effected, Woodring offers other less profound suggestions, many of which have already been implemented.

HUMAN RESOURCES

STATISTICAL SURVEYS

- The Council of Graduate Schools in the United States, by J. Boyd Page

  Report on the CGS Doctorate Production Survey

  The Council of Graduate Schools in the United States. Washington, D. C., May 3, 1972. (Mimeographed.)

  This report by the President of CGS presents current information gained from a recent survey of the CGS membership. In the study the deans of graduate schools which awarded one or more doctorates in 1969-70 were asked to give their individual projections of how many doctorates their graduate schools would confer in 1975-76. The responses received from 120 graduate schools, which collectively conferred over 76% of the doctorates granted in the base year 1969-70 (29,872), show that total doctorate production production projected in 1975-76 will increase just a little more than 5% above the reported production in 1969-70, or to 31,400. Page noted that production of Ph.D.'s is the current year (1971-72) is estimated at 32,000, and what is projected for 1975-76 is an actual decrease from the current rate. This is contrary to projections made by others for 1975-76, as are the deans' estimates of Ph.D production by 1980-81, which fall far short of forecasts made by USOE and other prognosticators.

  The data of the study do not support the views commonly held by a large number of decision makers in government and in the general population, that graduate schools are continuing to expand irresponsibly, that large numbers of Ph.D.'s will be trained far in excess of needs or likelihood of their being able to find appropriate employment. Neither do analyses of the data obtained bear out many of the assumptions made about the impact of marked reductions in federal aid upon different classes of institutions because the largest Ph.D. producers have felt the greatest impact. If the conclusions from this study have validity, serious questions are posed about the match between possible needs for Ph.D.'s and production capability. It is possible that society has overreacted to assumed excesses and our concern in the 1970's may be more with shortages than surpluses; these and related major problems require more detailed study and analysis.

- Kidd, Charles V.

  Shifts in Doctorate Output by Types of Universities in the 60's and Projected for the 70's

  Proceedings of the Fourteenth Annual Meeting. Western Association of Graduate Schools. Tempe, Arizona. 38-58. March 5-7, 1972.

  Kidd points out the shifting trend in the production of doctorates by type of universities, beginning in the 1960's and projected to continue into the 1970's. Namely, during the 60's the proportion of doctoral degrees

granted by the 30 public and private institutions with the highest reputations dropped from about 85 to 65% and a further decline is projected in the 1970's. Six reasons for the shift are given and the rapid decrease in federal funding at the more prestigious schools is stressed as overriding. The important implications and consequences of these shifting trends for all sectors and the forces that account for them, are analyzed and discussed in detail. It is concluded that the relative quality of the universities that expanded most rapidly in the 1960's will be lifted in the 1970's; the prestigious universities, particularly the top private ones, will decrease in eminence in the 70's but will still remain the strong centers for research and graduate education.

National Research Council. Office of Scientific Personnel. Manpower Studies Branch

- Summary Report 1971: Doctorate Recipients from United States Universities

OSP-MS-6. National Research Council. Washington, D. C. April, 1972.

This report presents a brief summary of data gathered from the Survey of Earned Doctorates during fiscal year 1971. The Survey is conducted annually by the Office of Scientific Personnel (OSP) of the National Research Council. Questionnaire forms, distrubuted with the cooperation of the Graduate Deans, are filled out by the graduates as they complete all requirements for their doctoral degrees. The report is composed of four tables: number of doctorate recipients by subfield of doctorate; statistical profile of doctorate recipients in graduate school and by summary field of doctorate; and number of doctorate recipients by state and summary field doctorate and the number of doctorate-granting institutions by state. Salient highlights of the report are: the total number of doctorates for all fields in 1971 was 31,772 compared to 29,436 in 1970; postgraduate plans of the FY 1971 doctorate recipients indicated that 25,019 or 77.8% planned employment, 4,791 planned postdoctoral study, and the remainder (6.2%) did not indicate postgraduate plans; the percentage of doctorates taking a postdoctoral study appointment was slightly higher in 1971 (15.1%) than in 1970 (14.5%), and those reporting to prospects for study or employment at the time of reporting was about the same for the two years (12.6% and 12.4%).

- National Science Foundation. Division of Science Resources Studies

American Science Manpower, 1970

A Report of the National Register of Scientific and Technical Personnel. NSF 71-45. U. S. Government Printing Office. Washington, D. C. October, 1971.

This reference document is the eighth and last in the biennial series which began in 1954. The report brings together detailed statistical

information collected from 313,000 physical and mathematical (60%), life (25%), and social scientists (15%). Data are presented in terms of education, employment, salary, field and subfield of science, state and metropolitan area distribution, support by Federal funds, university and college scientists, women scientists, and foreign-lanuguage capability.

The National Register finds that: the proportion of personnel with doctorates as the highest earned degree increased to 40% from 37% in 1966 and 1968; the proportion with master's degrees increased from 27% in 1966 to 29% in 1968 and to 30% in 1970; bachelor's degrees were reported as 27%, down from 30% in 1966 and 1968; the proportion of scientists employed by industry decreased, while those employed by educational institutions increased, and those employed by the Federal government remained constant; the proportion of doctorate and master's degree holders employed by colleges and universities increased, while the proportion of bachelor degree holders employed decreased; the proportion of all registrants in research and development decreased; the proportion in teaching increased and in management or administration increased slightly; scientists' median number of years of professional experience increased from twelve years in 1966 to fourteen years in 1970; the median age increased from 38 in 1966 to 39 in 1970; the gap between median salaries of men and women scientists narrowed slightly between 1968 and 1970; eight states accounted for one-half of the total registrants; the median salary increased; and the proportion of registrants receiving Federal funds decreased from 43% to 40%.

EMPLOYMENT OPPORTUNITIES

- Alberty, Robert

The Outlook from the University (the Natural Sciences)

Proceedings of the Tenth Annual Meeting. James N. Eshelman, editor. Council of Graduate Schools in the United States. Miami Beach, Florida. 37-41. December 2-4, 1970.

Alberty discusses three basic questions concerning the graduate education in the natural sciences: what will the job situation be for people with doctorates in the natural sciences; how many graduate students in those sciences should there be: and how can we improve graduate study in the natural sciences. He suggests that the need for Ph.D.'s in the sciences will increase, but that hiring rates will be lower; that training toward wider responsibility in society and away from rigid specialization should be encouraged.

- DeWitt, Laurence B., and A. Dale Tussing

The Supply and Demand for Graduates of Higher Education: 1970 to 1980

EPRC Research Report RR-8, prepared for the U. S. Office of Education, Contract No. OEC-1-7-071021-4429. Educational Policy Research Center, Syracuse University Research Corporation. Syracuse, New York. December, 1971.

This EPRC study is a fairly complete summary of current supply and demand considerations for higher education. The authors take a detailed look at the supply and demand for B.A.'s, Ph.D.'s, and teachers. There is a discussion of: the impact of recessions on academia; the nature of long-term, skilled manpower projections; the potential surpluses of college graduates, teachers (including college and university), and Ph.D.'s and their employment in academia, industry, and government. The report concludes that there is no particular danger of the fundamental surplus in the output of B.A.'s in the 1970's. There does appear a reason to suspect an overproduction of Ph.D.'s; however, the "extra" Ph.D.'s of about 20,000 per year are only about two one-hundredths of 1% of the total work force. There seems to be an oversupply of elementary and secondary teachers. It is concluded, however, that the unemployment rates for college graduates, teachers, and Ph.D.'s are quite low and that the more education a person has, the less likely he is to experience unemployment. The "surplus" workers are usually able to find other jobs though are perhaps "underemployed," admittedly and hard term to define empirically. The current manpower surpluses experienced by highly skilled and trained scientific personnel through the cutbacks in federal research and development expenditures, combined with the recession, makes it more difficult for them to find new employment. An informed federal policy directed at ameliorating this surplus would have to be based upon some knowledge of the strength, effectiveness, and rapidity of the response of individuals, schools of higher education, state governments, and other nonfederal sources to the imbalances of supply and demand.

- Harvey, James

Effects of the Ph.D. Glut

Change, Vol. IV, No. 3, 13, 71, April, 1972.

Harvey begins by noting that the effects of the glut are not evenly felt through all fields and that the real problem is not massive unemployment but the failure of the job market to meet the Ph.D.'s high expectations. The current unemployment results from financial constraints on research rather than a glut. Harvey feels that the rate of production of doctorates will lead to an upgrading of positions; he lists other effects and recommendations. Harvey concludes, however, that the problem is essentially political.

- Harvey, James

  Ph.D.'s and the Marketplace

  Research Currents (ERIC Clearinghouse on Higher Education, The George Washington University). American Association for Higher Education. Washington, D. C. February 1, 1972.

  This report is a review of the literature relating to the current manpower debate, it suggests the outlooks for broad disciplinary areas, and includes a bibliography of the subject. The paper reiterates many of the supply-demand analyses, predictions, and recommended solutions found in other recent treatises on the Ph.D. manpower situation. It concludes that Ph.D.'s are expensive to produce; but once produced, this manpower is too valuable and the social needs to pressing to allow doctoral recipients to waste their talents in unsuitable positions.

- Huther, John W.

  Small Market for Ph.D.'s: The Public Two-Year College

  AAUP Bulletin, Volume LVIII, No. 1, 17-20, Spring, 1972.

  According to Huther, the expectation that the public two-year college will absorb the surplus Ph.D.'s appears ill-founded. He bases this theory on a survey conducted in October 1971 at 312 public two-year institutions (representing 63% of students enrolled nationally and 56% of full-time faculty employed in all public two-year colleges), which revealed that only 8.5% of newly hired faculty hold Ph.D.'s. This was the case even though the hiring season for 1971-72 may have been the first in which the full impact of the Ph.D. surplus was felt, and Huther feels that this low percentage casts doubts upon the projections being made for high rates of Ph.D. employment at public two-year colleges. Huther constructs a projection and also draws upon the attitudes of two-year college presidents who are not receptive to hiring Ph.D.'s or D.A.'s because of their inappropriateness and the prohibitive costs, to further validate his hypothesis.

- Vetter, Betty

  The Changing Demand for Scientists and Engineers

  Proceedings of the Fourteenth Annual Meeting. Western Association of Graduate Schools. Tempe, Arizona. 5-14. March 5-7, 1972.

  The author reviews and evaluates the supply-demand picture for Ph.D.'s in science and engineering in light of current changes and trends. She concludes that the available statistics that measure both supply and demand indicate no substantial surplus of scientists and engineers in the immediate future, and the shortages, particularly at the bachelor's level, that appear to dominate the second half of the decade will not be serious enough to jeopardize national progress. It is emphasized that graduate students about

careers, must become more flexible and accommodate to change. Vetter believes that in the long run the worst part of the current unemployment crisis may turn out to be that which is resulting from the crisis of unmet expectations among new master's and Ph.D.'s.

- Wolfle, Dael, and Charles V. Kidd

The Future Market for Ph.D.'s

Science, Volume CLXXIII, No. 3999, 784-793, August 27, 1971.

This paper, drawing on the discussion, papers, documents, and comments from a conference held in Washington, D. C., in April, 1971, summarizes and interprets recent work on both supply projections and demand analyses. It treats the impact of the increased rate of Ph.D. production upon policy issues for universities and government; discusses the differences in the rates of increase projected; and analyzes the assumptions on which the estimates were based, the methods employed, and some of the implications for policy and planning. The topics discussed include: doctoral supply, utilization, the market in the 1970's and 1980's, growth in selected areas, reliability of the projections, implications of a buyer's market, ways to increase demand and restrain expansion, and stresses the needs for better information and analysis and collective action.

The authors conclude: that the processes of adjustment ahead will be difficult and the disadvantages arising from ignoring the problems will far outweigh the stresses generated by efforts to cope with it; on the supply side, more stringent admission standards, quotas, reduced financial support, incentives, or other means of controlling the production of doctorates will seriously challenge established values, frustrate many students and faculty, exacerbate tensions among "have" and "have not" institutions, aggravate the uneasy university-government relationships, complicate faculty-administration problems, and accentuate differences and competition between older and younger faculty members; input factors and other potential demand influences could affect output and utilization, but the net effect of counterbalancing forces are more apt to cancel out in the long term, and new approaches in Ph.D. preparation and attitudes about career opportunities will have to change.

NEEDS AND PRIORITIES

- Cairns, T. L.

The Outlook from Industry

Proceedings of the Tenth Annual Meeting. James N. Eshelman, editor. Council of Graduate School in the United States. Miami Beach, Florida. 33-37. December 2-4, 1970.

Solutions to many of the great problems facing society will be found through interdisciplinary research, and environmental problems are a prime target for such an approach. In tackling these problems, it would be a

great mistake, however, to weaken the classical disciplinary departments. More than 60 new chemistry departments were created since 1960; in June 1969, these granted only 140 Ph.D.'s as opposed to the 1,800 Ph.D.'s granted by the earlier established 125 departments. There seems to be no need for establishing new chemistry departments, except perhaps for geographical reasons. Chemistry faculty at four-year institutions should be given more opportunity for leave, and technicians should be used in the conduct of research. In terms of the science curriculum, there is need for greater flexibility and for encouraging Ph.D.'s to develop greater awareness of peripheral fields. As for scientific manpower needs in industry, inflation and rising costs have forced a reduction in recruitment. Improved business conditions will change this picture.

- Freeman, Richard B.

  The Science Manpower Market in the 1970's

  Draft of a larger and unpublished study. The National Science Board. Washington, D. C. 1972. (Mimeographed.)

  Freeman discusses the extent of the problem in the science manpower market and suggests that the two main factors affecting it are the way in which the market adjusts the exogenous shifts in demand and supply, and the R&D and manpower policies of the federal government. He looks at adjustments in the market and advances four propositions regarding them. In the final section, Freeman develops a forecasting model to project the number of scientific workers that will be demanded and supplied in this decade. Seventeen of the thirty pages of this study are tables and graphs supporting his hypotheses.

- Ginzberg, Eli

  The Outlook for Educated Manpower

  The Public Interest, No. 26, 100-111, Winter, 1972.

  The reasons for the high unemployment rate, the failure of agencies to anticipate the surpluses, the probable extent of the current situation, and the kinds of efforts needed to adjust to the current supply and demand problems, are reviewed. The conclusion reached was that although the situation is serious, it may not be as grave as many think. The author recommends that the following steps be taken: to consider the manpower implications in federal budgeting when large military or civilian programs are initiated, expanded, or continued; to develop a long-term policy for the federal support for science with regard to both level and rate of growth and the consequences of erratic fluctuations on manpower distortions; to develop a long-run federal policy for support of graduate higher education that will help keep solvent the 100-odd principal university centers that provide graduate student support by a judicious mixture of grants and loans; and, to consider alternative staffing arrangements in launching or expanding large federal programs, e.g., health--with the aim of economizing in the use of specialists with long periods of training.

- Holden, Constance

Job Market Rallies a Bit for June Graduates

Science, Volume CLXXVI, No. 4033, 392, April 28, 1972.

This Science reporter assesses the current status and the future job market outlook for scientists and engineers and reports that although employment is slightly better than it was a year ago, and professional associations and placement officers feel that the market has bottomed out, it is still nothing to rave about.

Employers are still interested only in the cream of the crop; good students from top schools may get more offers per capita than they did last year, but marginal students still have an uncertain future. Placements have picked up following clarification of Phase II policies, and industry jobs, closely tied as they are to the economy, are becoming available faster than those with the government or in academia. Beginning salaries this year are creeping up at last year's rate of about 2% and opening salaries for scientists and engineers are far above those for humanists and social scientists (up to $250/mo. more) at the bachelor's level and proportionally more at the master's and Ph.D. level (the beginning Ph.D. in electrical engineering commands an average salary or $1,372/mo.).

Physics and chemistry are still the two hardest-hit groups in science and this is causing a change in attitude, reorientation to applied research, and decreased interest and enrollment in these fields. The number of Ph.D. physicists has remained static from 1971 to this spring; one AIP projection indicates that the yearly output of B.S. physicists, which was down to 5,300 this year, may go as low as 1,100 by the end of the decade; this in turn could affect graduate degree production severely. Betty Vetter of the Scientific Manpower Commission predicts that there will be a shortage of engineers by 1980 because of the overreaction to the current job situation resulting in decreased enrollment which will be felt toward the last of this decade.

- Metz, David

Ph.D.'s Should be Planned

New Scientists, Volume LIII, No. 783, 386-388, February 17, 1972.

This article reflects the current argument about the role of the Ph.D. in British universities, i.e., is it advanced general education for the more capable or does it represent professional training to acquire research methods? Metz presents the sobering statistic that Britain's pool of Ph.D. scientists will eventually double, even with no increase in the numbers of Ph.D. candidates; he projects that the future chances for their full employment are poor and recommends the establishment of a new manpower planning body to cope with the potential situation.

- National Education Association

A Critical National Problem: Under-Utilization of Teachers and Other College Trained Personnel

National Education Association. Washington, D. C. February, 1972.

The major thesis of this document is that the supply of young manpower is growing at a record rate, the number of jobs is not growing as rapidly as a few years ago, and this situation is more critical for college educated manpower than for workers who have not attended college. Action is needed now to assure that large numbers of jobs are created which are consistent with national goals and which are also appropriate to the capabilities of the increasing supply of college graduates. Tables illustrate, with figures since 1960, the growth of the labor force, male graduates receiving bachelor's and first professional degrees, the number of unemployed, employment trends, employment offers to college graduates, and the unemployment of white and nonwhite males ages 20-24. Increasing the number of jobs in public education would be the most desirable area for enlarging the number of jobs for college graduates. Provision of resource personnel and supportive professional services would require the addition of more than 100,000 school librarians, at least 20,000 guidance personnel for elementary schools, and an unspecified number of persons in other professional positions which need to be created to give all students and teachers access to the services of qualified practitioners in psychological, health, and social service disciplines.

- National Research Council. Office of Scientific Personnel. Manpower Studies Branch

Employment of New Ph.D.'s and Postdoctorals in 1971

A Survey Report. OSP-MS-5. National Research Council. Washington, D. C. August, 1971.

This report summarizes the results of a survey of doctoral departments in U. S. universities in the winter of 1970-71 to determine the current employment status of recent recipients of the doctorate and of immediate postdoctorals in the sciences and engineering. It does not attempt to discuss the employment situation of older doctoral scientists and engineers. The survey report reveals that the employment status in mid-winter 1971 of Ph.D.'s of academic year 1970: 14.3% received a postdoctoral appointment; 70.2% became employed in appropriate work in the U. S.; 8.3% left the U. S.; 1.2% became employed in positions which did not utilize graduate training; 1.2% were unemployed (this figure includes those seeking and those not seeking employment); 0.6% were serving in the military or other status; and 3.8% of the respondents' employed status was unknown. The employment status in mid-winter 1971 of Ph.D.'s who had been in postdoctoral training in academic year 1970, excluding those who were still holding the postdoctoral appointment, 52.9% became employed by academic institutions; 18.8% became employed by nonacademic institutions; 0.9% became employed in inappropriate positions; 2.2% were unemployed (including those seeking and those not seeking employment); and 11.2% had an employment status unknown. The survey showed that differ-

ences existed among fields of specialization. The 1970 Ph.D.'s and post-doctorals in mathematics and geosciences had the lowest unemployment rate and physicists had the highest--2.9% of the Ph.D.'s and 3.3% of the post-doctorals.

- National Science Board

The Role of Engineers and Scientists in the National Policy for Technology

Fourth Annual Report of the National Science Board. U. S. Government Printing Office. Washington, D. C. 1972.

Calling for a national commitment to the technologies of peace as strong as has been the commitments over the past 30 years to the technologies of war, defense, and space, the Board urges: a new federal government role in stimulating and supporting research and, where desirable, development in American industrial technology; the provision of adequate means of technological assessment as a balance for that stimulus; and major efforts to enlarge and focus the contributions of science and engineering toward finding solutions for complex societal problems.

In his transmittal of the report to Congress, President Nixon points out the key parts of the report that are in "close accord" with his own recent message to Congress on Science and Technology and with other statements he has issued.

Briefly summarized, the Report offers five recommendations: government aid to support basic and applied research both in mature and advanced industries that are not providing adequate support for needed research; government aid for R&D in technologies needed for improving the provision of public goods and services; launching major efforts by groups of full-time professionals of outstanding competence to develop approaches to long-range solution of major national problems; federal and industry initiatives to enhance public understanding of technology by educational programs in and out of the classroom; and the creation of new capabilities for technology assessment and wide dissemination of the need for these capabilities and the findings of assessment as they become available.

- National Science Foundation. Division of Science Resources Studies, by Charles E. Falk, Director

Scientific Human Resources: Profiles and Issues

NSF 72-304. U. S. Government Printing Office. Washington, D. C. 1972.

This report on scientific and engineering manpower constitutes a summary which reviews past trends and events, describes the current status, and compares various assessments made of possible future situations. Covering the period from 1960 through 1970 and with projections to 1980, statistical data are given on: national R&D funding, degrees granted in all fields and in science and engineering by the level of degree, demographic data, total numbers

of scientists and engineers, Ph.D. scientists and engineers, distribution of non-Ph.D.'s and Ph.D.'s by activity area, advanced degree enrollments, and unemployment rates. Charts are used in discussing the various opinions of NSF, Cartter, Froomkin, McGinnis, Hall, and the U. S. Office of Education on the production, supply, and utilization of doctorate scientists and engineers in the "immediate future" and in the "long-range future." National science manpower planning, both in production of scientific manpower and in the development of the institutions which train them, indicates clearly that more manpower planning than ever is required. There are certain limitations inherent in the manpower supply/utilization based on the available resources and the fraction of the population capable of becoming scientists. A continuing evaluation should be made of the manpower constraints which place an upper limit on the quantity of resources that could be utilized.

- Perloff, Robert

Enhancing Psychology by Assessing Its Manpower

American Psychologist, Volume XXVII, No. 5, 355-361, May, 1972.

As the guest editor of a special issue of the American Psychologist, Perloff reviews the manpower questions as related to the field of psychology. He examines closely manpower predictions and career choices, manpower demands and training implications, the question of whether the Ph.D. glut is real, the need for monitoring programs, and possible remedial strategies.

He notes that the effects of illusory prognostications not only play havoc with the plans of training institutions and other organizations, but they also may have disastrous implications for the morale and career plans of young people. In commenting on the APA Task Force on Manpower Demands and Training Implications, he notes that their chief recommendation was that a continuous personnel monitoring system or job clearinghouse be established, making possible in the future approximate answers to questions about manpower requirements which at present are essentially speculative.

- Polinger, Madeleine

Chemical Employment Should Bottom Out in 1972

Chemical and Engineering News, Volume L, No. 13, 10-11, March 27, 1972.

Although only a few companies have increased recruiting and hiring in 1972, the author reports that this is a harbinger of a more general upturn in chemical employment likely to occur in 1973. The College Placement Council shows in their survey that drug and chemical firms are expected to hire about 14% more graduates in 1972 than in 1971, the tight supply of academic positions may have loosened up a bit, but the employment needs for chemists and chemical engineers remain about static.

- Roaden, Arliss L.

The Master's as Preparation for Teaching in Colleges

Proceedings of the Tenth Annual Meeting. James N. Eshelman, editor. Council of Graduate Schools in the United States. Miami Beach, Florida. 62-69. December 2-4, 1970.

Based on various data, some of which he details, Roaden makes the following generalizations about the future: there will be little change in the hiring of Ph.D.'s at two-year institutions within the next eight to ten years, or in all sources of new faculty for those institutions; quantitative needs will be severe and will be supplied in part by people from programs in professional education, possibly lowering quality; and until the D.A. has impact, the master's program tailored for teaching is desirable. He suggests that recruiting for college teaching be done in lower-division undergraduate ranks so that undergraduate as well as graduate study can be reshaped in order to better prepare college teachers, and that the generation of new knowledge, a function of graduate education presently out of the spotlight, not be forgotten.

- Rose, Richard M.

Supply and Demand for Psychology Ph.D.'s in Graduate Departments of Psychology: 1970 and 1971 Compared

American Psychologist, Volume XXVII, No. 5, 415-421, May, 1972.

In late January 1970, questionnaires were mailed to 255 chairman on the 1969-70 National Council of Chairmen of Graduate Departments of Psychology (NCCGDP) list, and in early April 1971, a second mailing of questionnaires was made to the 267 chairmen on the 1970-71 NCCGDP list; these lists include about two-thirds of all graduate departments of psychology in the United States and Canada. In 1970, 69% of the sample of graduate departments returned a completed questionnaire, while in 1971 this figure was 57%. The responses provide the statistical basis for seven tables which form the bulk of the article. Rose concludes that new Ph.D.'s seeking a career of teaching and research will encounter increasing difficulties; this in turn will tend to create the impression of a restricted field. The long-range effects on supply and demand in psychology, however, is impossible to predict with any certainty.

- Rosenhaupt, Hans

Are There Too Many Doctors in the House?

Woodrow Wilson Fellowship Newsletter, No. 20, 1, 8, May, 1970.

The author reviews the much publicized surplus of Ph.D.'s and employment difficulties in the job market; he prefers to call the situation a "job pinch" rather than a "Ph.D. Glut." The well known causes for the pinch are described and solutions are proposed. Rosenhaupt considers the Doctor of

Arts oriented to teaching as a promising development for the future and indicates that the Woodrow Wilson program will continue to use their funds to support graduate students and to recruit some of the best college seniors for careers as teachers.

- State of Illinois. Board of Higher Education

  Committee V: Engineering

  State Board of Higher Education, Springfield, Illinois, October, 1970. (Mimeographed.)

  Among the charges to the Committee was, "How can graduate and professional education in engineering be improved?" The general findings and recommendations of the Committee included: the well-being of the country as a whole and the State of Illinois especially depends critically upon educating engineering students and engineers in practice to the highest level of their capabilities and aspirations; as a result, planning should be authorized for the substantial addition of buildings, equipment, and staff needed to permit growth from the present level of about 650 master's and 250 doctor's degrees per year in engineering to a yearly level of about 2,100 master's and 600 doctor's by 1980.

- Verplanck, William S.

  Supply, Demand, and Salary Profiles, as Seen by a Graduate Department Head

  American Psychologist, Volume XXVII, No. 5, 422-424, May, 1972.

  The lack of a consensus among individual legislatures, individual donors, and each student and each parent makes the determination of a supply and demand pattern difficult. Students, the author feels, are accelerating change in psychology by pressures in the courses they take and by their activities as they apply for graduate education and enter into the discipline. Verplanck sees the students being present and the tools being absent. The author feels that any predictions concerning supply and demand are impossible because of the inordinate number of variable factors that effect their fluctuation.

- Weathersby, George B.

  Structural Issues in the Supply and Demand for Scientific Manpower: Implications for National Manpower Policy

  Ford Foundation Program for Research in University Administration, Grant No. 680-267 A, Paper P-30. Office of the Vice President--Planning, University of California. Berkeley. May, 1972.

  As one of the continuing series of reports of the Ford Foundation sponsored Research Program in University Administration at the University

of California, Berkeley, this paper suggests that in addition to responding to surface manifestations of imbalance in scientific manpower supply and demand, we should examine and understand far better than we now do the nature and extent of the structural forces operative on the supply and demand of scientific talent. The author argues, after reviewing the literature and the parameters of the current situation of an apparent surplus, and admitting that there is no unanimity on the remedial policies of the federal government that should follow, that long-range national manpower planning must take a very broad view both of national economic and social objectives and of alternative productive technologies and the implications for both in terms of requisite manpower. Weathersby is concerned that long-term federal manpower policies are nothing more than short-term reactions dealing more with sympthoms than with basic causality. He suggests that we should view the issue of manpower supply and demand from the perspective of formulation of more comprehensive, even if they be crude, national objectives, and from these deduce objectives for intermediate goals to attain. This strategy might well lead us to significantly different conclusions about appropriate federal policies and programs.

MOBILITY AND UTILIZATION

- Morris, Jeffrey

Educational Training and Careers of Ph.D. Holders: An Exploratory Empirical Study

Ford Foundation Program for Research in University Administration, Paper P-27. Office of the Vice President--Planning, University of California. Berkeley, California. January, 1972.

Produced as one of the reports of the Ford Foundation sponsored Research Program, this study analyzes the occupational mobility of individuals who hold the Ph.D. It draws upon data contained in the National Register of Scientific and Technical Personnel compiled by NSF and presents the quantitative relationships between educational background, occupational mobility, and salaries. Based on these results, the author then presents and empirically tests an economic theory of Ph.D. occupational mobility. It was concluded that not only does specialization as defined for the NSF sample have costs if the Ph.D. wants to move to another occupation, it is costly also if he remains employed in his field of specialization.

- National Research Council. Office of Scientific Personnel

Education and Employment Patterns of Bioscientists: A Statistical Report

National Academy of Sciences-National Research Council. Washington, D. C. February 1, 1971.

Prepared under the sponsorship of the NIGMS and NIH, the report contains a compilation of manpower statistics describing the education and employment of bioscientists. The tables presented include data from other major disciplines in order to allow for comparisons with other scientists or nonscien-

tists. The purpose of the study is to present objective data collected from a variety of sources, which should be useful to policy makers and as a broad frame of reference for further, nondetailed manpower studies. An annotated bibliography of major source documents is provided.

- National Research Council. Office of Scientific Personnel. Research Division. Lindsey R. Harmon, Director

Mobility of Ph.D.'s Before and After the Doctorate, with Associated Economic and Educational Characteristics of States

Career Patterns Report Number Three, National Institutes of Health Contract PH 43-64-44. National Academy of Sciences. Washington, D. C. 1971.

Undertaken with the support of NIH, this report is concerned specifically with mobility of holders of the doctorate, although the analysis begins with the premise that social economic, disciplinary, and occupational mobility characterize all but the very poorest of our society. Both international and domestic migration are considered both before and after receipt of the Ph.D. A technique involving a quantitative metric of geographic movement was devised wherein movement in 10-mile units at various career stages in eight directions are pictured graphically by means of a computer program based on the geographic grid.

Highlights of the study show: about 19% of U. S. Ph.D.'s are foreign-born, almost 15% are foreign citizens, and from 1965-1968 43% of these planned to remain in the U. S. although this percentage varies widely by field and economic status of the country of origin; doctorate production in the U. S. has changed its geographic distribution progressively over the past 50 years from originally being concentrated in the northeastern states to a more equitable extension across the country; states vary enormously in their standing on a per capita basis as producers (origins) and as consumers (destinations) of Ph.D.'s, although high producer states are also high consumers--but the reverse is not true; three per capita indices were derived for each state: an economic prosperity index, an index of higher educational development, and an index of elementary-secondary school strength; these indexes are positively but not highly correlated, the highest correlation being between economic prosperity and the elementary-secondary school index; state profiles prepared on these bases show the West as outstanding in the relative strength of its elementary-secondary school systems, the Northeast in economic strength, and several eastern states in higher education development; and migration tends to distribute Ph.D.-trained people from the more affluent (educationally and economically) portions of the country to the poorer sections, but only partially.

The study did not answer whether Ph.D. migration is primarily a creator or consequence of economic prosperity, field variations, or quality differences in migration.

- U. S. Department of Labor. Manpower Administration.

  Manpower Issues in the Professions and Higher Education

  1972 Manpower Report of the President. U. S. Government Printing Office. Washington, D. C. 103-138. 1972.

  This reprint of a chapter in the 1972 Manpower Report of the President discusses the changed job market for professional personnel, the job market turnaround, and prospective trends in demand and supply. It reviews the outlook for Ph.D.'s, elementary and secondary school teachers, scientists and engineers, physicians, nurses, and allied health personnel, and presents a number of charts and graphs.

ENROLLMENTS, PROJECTIONS AND GOALS

- Balderston, F. E., and Roy Radner

  Academic Demand for New Ph.D.'s, 1970-90: Its Sensitivity to Alternate Policies

  Ford Foundation Program for Research in University Administration, Grant No. 68-267, Paper P-26. Office of the Vice President--Planning and Analysis, University of California. Berkeley. December, 1971.

  This report, one of a series under the research program sponsored by the Ford Foundation, investigates the plausibility of various projections of academic demand for the doctorate over the next two decades. It examines the influence that faculty appointment in different sectors of higher education has on this demand and offers some policy implications relevant for various decision-makers involved in higher education. The report tests in some detail the soundness of recent projections of academic demand for new doctorates, discusses the way in which various factors may influence utilization by the major sectors of American higher education, and suggests some positive policy choices in the financing and staffing standards of higher education.

- Bock, Robert M.

  Ph.D.'s Coming and Going (Letters section)

  Science, Volume CLXXIII, No. 3991, 6, July 2, 1971.

  In a "Letter to the Editor," Bock supports Cartter's recommendation for more objective and better manpower forecasting methods. Based on an April 1971 survey, Bock and his colleagues at Wisconsin are convinced that the present forecasts of 48,000-80,000 new Ph.D.'s annually by 1980 are too high and fail to take full account of the remarkable adjustments that are occurring. The rate of growth of the past decade, based on the availability of public resources, cannot be sustained even by newer or emerging institutions

because state or federal funds for such expansion will not be available. Bock predicts that the level of Ph.D. ouptut in 1980 is likely to exceed the 1971 level only to the extent that emerging institutions can afford the great financial sacrifice of their own funds which such growth will require. Therefore to survive, the newer developing institutions must achieve a quality acceptable to the students who will be called upon to personally shoulder much of the cost involved.

- Brode, Wallace R.

  Manpower in Science and Engineering, Based on a Saturation Model

  Science, Volume CLXXIII, No. 3993, 206-213, July 16, 1971.

  The factors and reasons why young people in the past, currently, and in the future have been or will be attracted or repulsed from entering careers in science are examined and discussed. Among the major conclusions are: regardless of the population base, the relative percentage of those intellectually capable and motivated to complete a Ph.D. in science remains fairly constant; we must devise ways for preserving the technical abilities of those people whose careers require long training periods and who will be in short supply in the near future; and this can be accomplished by a "ready reserve" program as part of a revised Manpower Employment and Training Act now being considered at the federal level.

  Other topics examined are: approaching ceilings in scientific and technological manpower, career selection in science and engineering, changing size of the college-age population and census projections, a holding pattern for today's surplus and suggested short-term and long-term cures for the problems of the surplus, the ratio of B.S.'s to Ph.D.'s as a measure of an area's development, and the implications and prospects of a shortage of scientists and engineers in the future.

- Burns, Richard L.

  Report on the Council of Graduate Schools-Graduate Record Examinations Board 1971-72 Survey of Graduate Enrollment

  Educational Testing Service. Princeton, New Jersey. 1972. (Mimeographed.)

  The GREB and CGS jointly conducted a survey of graduate enrollment in the 298 graduate instition members of CGS during the fall of 1971. The response rate to the questionnaire was 93%; comparative data were derived for 1970 and 1971 and the sample statistics are highly representative of the total population. The results show a slight increase in total graduate school enrollment (1.4%) for the reporting institutions; private Ph.D. institutions decreased 1.3% but all private institutions increased by 0.1%, and private master's schools increased their overall enrollment by 9.2%; public Ph.D. graduate schools were up 1.6% and public master's institutions were up 2.8%. First-time enrollments for the total sample increased by 2.1% with 0.6% increase at private institutions and 2.6% increase at public schools.

The number of assistantships held by graduate students decreased in 1971, more for private than the public institutions. Fellowships showed a marked decline in 1971 (overall decrease of 11.5%).

Master's degrees were up 9.1% and Ph.D. degrees increased 8.4% in 1971, with the public institutions showing greater increase than the private schools at both levels.

It is planned to continue to collect and refine this type of information annually.

- The Carnegie Commission on Higher Education.

New Students and New Places: Polices for the Future Growth and Development of American Higher Education

McGraw-Hill Book Company for The Carnegie Commission on Higher Education. New York. October, 1971.

This report presents The Carnegie Commission's projections of enrollment in higher education to the year 2000, metaphorically described as a span of "Go-in the '70s--Stop-in the '80s--Go-in the '90s." The report then develops estimates of the ways in which these enrollment projections would be effected by implementation of the recommendations included in the Commission's earlier reports and in this report. Also presented are enrollment data and projections based on the Commission's classification of institutions of higher education. In addition, the report includes policy recommendations relating to the growth of institutions, maintaining innovation and diversity in higher education, needs for new institutions, and encouraging more flexible patterns of participation in higher education.

- Chemical and Engineering News

Big Enrollments Worry Chem Departments

Chemical and Engineering News, Volume L, No. 11, 22-23, March 13, 1972.

Enrollments in chemistry courses in 1971 were up by 9% from fall 1970. This occurred even as the total combined freshman enrollment at the schools surveyed dropped 2%. Organic chemistry course enrollments were up 14% from fall 1970. The survey suggests that chemistry majors who are unable to enter medical or public health schools may turn back to chemistry graduate training. As a result, graduate departments in chemistry, molecular biology, and bacteriology might have a flood of applicants in two or three years.

- The Chronicle of Higher Education

  Higher Education, 1980: New Federal Projections

  The Chronicle of Higher Education, Volume VI, No. 28, 1, April 17, 1972.

  Tabular data derived from unpublished tables of the NCES of the Office of Education are presented. Enrollments in public colleges and universities will increase by about 70% in the next decade (to nearly 11 million), according to USOE estimates. Enrollments in private institutions are expected to rise by about 8% to slightly more than 2.3 million, making a total enrollment of 13,277,000 projected by 1980. Resident graduate enrollment is expected to increase from 900,000 in 1970 to 1,499,000 by fall 1980; estimated master's degrees are projected to increase from 224,000 to 395,000; and Doctor's degrees, from 32,000 to 68,700 during the same interval.

- Falk, Charles E.

  Projections of the Doctorate Population

  Proceedings of the Tenth Annual Meeting. James N. Eshelman, editor. Council of Graduate Schools in the United States. Miami Beach, Florida. 14-28. December 2-4, 1970.

  There is a great deal of uncertainty about the graduate education of scientists and engineers. Students are worried about employment opportunities. Institutions worry about the quality and quantity of their future graduate programs, and the government worries about an adequate supply of trained manpower for the future. Added to these worries are the increasing suspicion of science on the part of the young, increased employment problems for scientists and engineers, and a limitation of students in the graduate programs, ostensibly for financial reasons. All this has pushed the production of Ph.D.'s downwards. Thirty percent of the doctorates in science are involved in nonacademic research, and in this area the federal government, the main supplier of funds, has been retrenching. Though private support for R&D has increased, this trend may not continue. The employment picture of scientists and engineers in higher education will depend on future enrollments. According to projections made by the NSF, doctorate production will increase by 60% over the next ten years, graduate enrollment in the sciences and engineering will increase from 60 to 65%, R&D expenditures will probably remain at 2.8% of the GNP, and the supply of scientists and engineers with the Ph.D. will probably be slightly larger than the demand, though this will vary and be more pronounced in engineering.

- Hansen, Harold P.

The Ph.D. Surplus--Realities and Illusions

Proceeding of the Tenth Annual Meeting. James N. Eshelman, editor. Council of Graduate Schools in the United States. Miami Beach, Florida. 120-125. December 2-4, 1970.

Every six years the number of Ph.D.'s produced doubles. At this point about 1% of the babies born 27 years ago gets a Ph.D. This production rate will probably increase to 6% of the adult population. With the present situation in higher education, which includes an average retirement after 40 years of service, the supply already outstrips the demand. The problem is, however, that the birthrate is declining, so freshmen enrollment in 1985 will be 20% less than freshmen enrollment in 1975. To deal with this future surplus of Ph.D.'s, students must be warned that a Ph.D. does not entitle them to a scholarly job. Students could also be kept longer out of the labor market by prolonging the time it takes to get a Ph.D., by increasing the number of postdoctoral programs, or by creating a new and more advanced degree. Another possibility would be the establishment of central government controls for the selection of prospective Ph.D.'s and their disciplines. Control could also be exerted by faculty organizations that could establish new hiring and retirement policies. Also, foreign graduate students should be allowed to study here only if they intend to return to their native country upon graduation. A final solution may be the establishment of federally supported centers and institutes where Ph.D.'s could do high quality research.

- Ingham, Roy J., et al.

A Survey of Graduate Programs in Adult Education in the United States and Canada

Unpublished paper, Department of Adult Education, Florida State University, Tallahassee, October, 1970.

Second in a series, this survey was designed to provide information about some aspects of graduate study in adult education in the United States and Canada. It differs from the first, dated July, 1968, in that only data likely to change appreciably in one year were included. Some of the major changes between the last and present reports are: full-time faculty increased from 55 to 88; part-time faculty decreased from 82 to 78, but 96 faculty from other departments were participating in the adult education program; full-time doctoral students increased from 330 to 387; part-time doctoral students increased from 369 to 526. At the master's level, full-time students increased from 556 to 753; a decline took place in the number of students engaged in writing their dissertation. The number of assistantships increased from 100 to 137; fellowships, from 22-to 44; and internships, from 55 to 77 (The questionnaire is included in the appendix.)

- Jacobson, Robert L.

  Ph.D. Surplus Seen Overestimated

  The Chronicle of Higher Education, Volume VI, No. 24, 3, March 20, 1972.

  The author reviews the report of DeWitt and Tussing, done under contract with the USOE, which questions the conclusions made in studies projecting a great overproduction of Ph.D.'s and public school teachers in the 1970's. Although acknowledging that the capacity to overproduce exists, DeWitt and Tussing have reservations about the accuracy of both the supply and demand figures being projected. They advise federal officials to respond cautiously to the projections, otherwise the danger exists that they will help turn surpluses into shortages. The main problem currently is viewed as under-employment occasioned by a short-term recession; this could be reversed by an upswing in the economy or by federal intervention through new program support.

- Jellema, William W.

  The Numbers Game: A Study of Enrollment Patterns in Private Colleges and Universities

  Association of American Colleges. Washington, D. C. January, 1972.

  This report presents data obtained from a survey conducted during the summer of 1970 in which private U. S. colleges and universities were asked to report on past and projected enrollment patterns for every year from 1965-66 through 1971-72. The various categories covered in the survey included freshman applications, freshman admissions, freshman head-count enrollment, total undergraduate head-count enrollment, total graduate head-count enrollment, total full-time equivalent undergraduate enrollment, and total full-time equivalent graduate enrollment. Findings generally show that enrollment has been decreasing in the last several years. Most of the participating institutions had predicted a rise in enrollment for 1970-71; however, a follow-up survey indicates that these predictions were wrong and that yet another decrease actually occurred. This constant decrease in enrollment is not only affecting institutional size but also the financial situation of the colleges. If private colleges and universities are to survive, they need to incorporate better studies, aggressive admissions programs and, above all, attractive academic programs into their regular college functions.

- Moses, Lincoln E.

  The Response of Graduate Enrollment to Placement Opportunities

  Science, Volume CLXXVII, No. 4048, 494-497, August 11, 1972.

  Moses begins by exploring the enrollment trends in physics, a discipline where more accurate records have been kept for a longer period of time. He arrives at two theses: first, that marked reduction in numbers of entrants to graduate study powerfully readjusts the size of the Ph.D. crop; second,

that, perceiving the adverse economic prospects, many fewer qualified students go into physics. He concludes that the decline in the numbers of undergraduate physics majors and the decline in the percentage of those going to become graduate students result from the perception of adverse placement opportunities. Moses realizes that it is dufficult to extrapolate a general case from the specific; however, he argues that there are two carry-overs. First, there is, at present rates of output, a large and substantial excess of supply over demand for Ph.D.'s and, second, a major consequence in adjusting to this excess will be a reduction of entrants into a Ph.D. course of study.

- National Science Foundation, by William V. Consolazio

The Dynamics of Academic Science

U. S. Government Printing Office. Washington, D. C. January, 1967.

The interaction of the American system of higher education with the federal government represents an exceedingly complex system that requires considerable study for proper appreciation and understanding. It is the broad objective of this report to further such appreciation and understanding specifically by: developing a profile of the sources of production of scientific and technological manpower of U. S. universities and colleges; assembling meaningful data on the nature, level, and distribution of federal funds for academic science; evolving and improving concepts and measuring techniques for ascertaining the contributions of academic institutions to scientific and technological manpower resources; and testing a model for the periodic examination of the relation of federal funds to academic science in particular, and to institutions of higher education in general.

- National Science Foundation. Division of Science Resources Studies. Science Education Studies Group

Trends in Graduate Education in Science and Engineering, 1960-70

Reviews of Data on Science Resources. NSF 71-15. No. 20. National Science Foundation. Washington, D. C. November, 1971.

Increases in science and engineering graduate enrollments and degrees paralleled or exceeded those in other fields until the middle of the last decade. Since then, relative interest in science and engineering at the graduate level has been steadily declining. While the number enrolled in these fields doubled in a decade, the proportion of those enrolled in science and engineering has fallen from 38% of total enrollments to 31%. Comparison of graduate enrollments and degrees with baccalaureates also reveals a lessening of interest in science and engineering among recent entrants into graduate training. There is already evidence of this at the master's level. However, in all fields except engineering, the decline was less rapid for the year 1969-70. The analysis of the data reveals that the decline of interest in science and engineering at the graduate level preceded the recent reductions in Federal support of graduate training.

The number of science and engineering master's degrees more than doubled in the last decade, increasing from 20,000 in 1959-60 to 49,000 in 1969-70; however, the master's degrees in nonscience fields tripled in the same period. Doctorates in science and engineering accounted for about 62% of all doctorates during most of the decade but have declined to 59% of the total, with the largest declines in the physical sciences, from 19% to 14%, and in the life sciences, from 17% to 14%.

- National Science Foundation. Division of Science Resource Studies. Universities and Nonprofit Institutions Studies Group

  First-Year, Full-Time Graduate Science Enrollment Continues to Decline

  Science Resources Studies Highlights. NSF 72-308. National Science Foundation. Washington, D. C. May 25, 1972.

  The findings in this study are the result of data derived from traineeship applications supplied to NSF by 2,990 doctorate-granting departments. They are considered highly representative of the national science enrollment picture covering 80% of the total U. S. enrollments in science and engineering, and 98% of doctorates awarded in all fields. The statistics are based on a total of 182,000 graduate science students in 1971, 78% of whom were enrolled full-time. The pertinent results gained from the study are: in doctorate-granting institutions, first-year, full-time graduate science enrollment decreased 5% between 1970 and 1971, after decreasing 2% in the previous year; the "top 20" graduate institutions experienced reductions in their first-year, full-time enrollment at the greatest rate; virtually all areas of science experienced reductions in first-year full-time enrollment--the exceptions were psychology and the social sciences; a 15% drop in the part-time physical sciences influenced the overall decrease; the number of full-time graduate students supported primarily by fellowships and traineeships declined nearly 10% from 1970 to 1971; the proportion of full-time graduate students receiving their primary support from the federal government declined from 37% in 1969 to 32% in 1971; public institutions attracted 68% and private ones 32% of the graduate science students in 1971--from 1970 to 1971, graduate enrollments declined 1% in public institutions but 6% in those under private control; and while total graduate enrollment declined, from 1970 to 1971 full-time graduate faculty increased slightly, and postdoctoral appointees increased by 5%.

- National Science Foundation. Division of Science Resources and Policy Studies. Universities and Non profit Institutions Group

  Recent Trends in Enrollment and Manpower Resources in Graduate Science Education, 1969-70

  Science Resources Studies Highlights. NSF 71-14. National Science Foundation. Washington, D. C. May 26, 1971.

  Based on information furnished by 227 doctorate-granting institutions in their applications for NSF traineeships, graduate enrollment in the

sciences and engineering declined slightly between 1969 and 1970. The 1969-70 decrease and the declining trend in the rate of growth during 1967-69 contracts markedly with the 9% annual rate of increase in enrollment for advanced degrees in the sciences and engineering that characterized the seven-year period, 1960 to 1967. In contrast to the decline in graduate enrollment, the number of faculty and postdoctorals increased during 1969-70, but at annual rates that were far below the comparable figures for 1967-69. The science doctorate departments covered in the present study accounted for more than 75% of the graduate enrollment and more than 90% of the doctorates granted in the sciences and engineering by U. S. universities and colleges.

- Orwig, M. D., et al.

  Enrollment Projection Models for Institutional Planning

  Research and Development Division, The American College Testing Program. Iowa City, Iowa. January, 1972.

  This paper examines alternative techniques for projecting freshman enrollment in specific academic departments. Departmental enrollment projections provided by four different projection models are compared to actual departmental enrollments at Kansas State University. Two of the models use only historical data, while the other two models are sensitized to current developments as indicated by the expressed major choices of prospective freshmen. The use of discriminant analysis to establish differential enrollment probabilities is also explored. Although different models do a better job for different curricular departments, the smallest mean squared across all departments was obtained with the simplest projection technique. Based on the results obtained at this one institution, therefore, it would appear that simple and straightforward projection models can be as useful as complex and sophisticated models.

- Taeuber, Conrad

  Population Trends of the 1960's

  Science, Volume CLXXVI, No. 4036, 773-777, May 19, 1972.

  Early results and trends which relate to higher education future planning are taken from the 1970 Census. There are now about 209 million residents of the U. S., almost twice the number in 1921, and about 24 million were added to the current total in the last decade. During the 1960's the rate of growth slowed, and in recent years, growth has been about 1% per year. The growth in the 1960's was unevenly distributed within the age groups; of significance to higher educational institutions was a nearly 50% increase in the number of 15 to 24 year-olds and about a 15% increase in the 5 to 14 year-old age group. The growth of metropolitan areas and geographic shifts are also of special interest. Full data on the 1970 Census results will be issued in the latter half of 1972.

- Thompson, R. B.

  Projections of Enrollments in Public and Private Colleges and Universities

  Unpublished paper, Ohio State University, Columbus, 1971.

  This paper discusses enrollment projections and trends in public and private colleges and universities. Total enrollment in higher education may reach 14 million by 1982 and 12 million of these students will be in public institutions, almost a 100% increase since 1970. Enrollments in private institutions will probably increase by only 5%; but the trend toward enrollment in public institutions has accelerated from 50% in 1950 to 75% in 1970. The peak number of college age youth will reach the campuses in the early 1980's and the numbers will drop after 1982. More than 85% of these students will be in public institutions. With the increasing trend toward public higher education, private institutions are facing grave financial problems and will have to receive public assistance either directly or indirectly if they are to continue to function. In both public and private institutions students will probably be asked to assume more of the financial burden by using deferred payment plans.

- U. S. Department of Health, Education, and Welfare. Office of Education. National Center for Educational Statistics, by Kenneth A. Simon and Marie G. Fullam.

  Projections of Educational Statistics to 1977-78

  1968 Edition. U. S. Government Printing Office. Washington, D. C. 1969.

  Based on the assumption that enrollment rates through 1977-78 will continue the trend from 1957-58 to 1967-68, projections are determined for several key educational statistics, including enrollment for all levels from kindergarden through graduate study, number of high school graduates and college degrees, number of teachers and other professional staff, expenditures of educational institutions, and basic student charges for institutions of higher education.

- U. S. Department of Health, Education, and Welfare. Office of Education. National Center for Educational Statistics, by Mary Evans Hooper and Marjorie O. Chandler

  Students Enrolled for Advanced Degrees, Fall 1969: Summary Data

  U. S. Government Printing Office. Washington, D. C. 1970.

  This summary report is based on the U. S. Office of Education's 11th annual survey of students enrolled for advanced degrees. Included in this publication are summary enrollment tables by level of study, attendance status, sex of student, field of specialization, state or other U.S. area, and institutional control and level. Comparisons are also made with the previous year's data. The survey report form is included in the appendix.

- University of Maryland. The Graduate School

  More on the Numbers Game

  Graduate School Chronicle, Volume V, No. 3, 1-2, May, 1972.

  This report compares the 1970-71 graduate enrollment to the 1971-72 outlook, nationally and by campus of the University of Maryland. The fall 1971 national poll conducted jointly by CGS-GREB indicated little increase in the total graduate school enrollment over 1970; for example, only a 1.6% increase was noted at public, doctorate-granting institutions and a 2.8% increase was experienced in public institutions in which the master's degree offered. By campus, the University of Maryland graduate programs for 1971-72 showed only a slight increase over 1970-71--thus reflecting the national trend. However, the Graduate Records Office at College Park currently reports an 11.7% increase in applications for graduate study over the comparable period a year ago.

- Vaughan, Ted R., and Gideon Sjoberg

  The Politics of Projection: A Critique of Cartter's Analysis

  Science, Volume CLXXVII, No. 4044, 142-147, July 14, 1972.

  The authors review the series of articles published by Allan M. Cartter from 1965 to 1971 advancing the thesis that American graduate education is oriented toward the systematic overproduction of Ph.D.'s, and express their concern that Cartter's analysis has serious weaknesses which make it highly unreliable to justify the weight and undue influence it has already enjoyed for policy making in graduate education. They fear that the ready acceptance of Cartter's conclusions will result in irreparable damage to the immediate and long-term production of Ph.D.'s.

  Specifically, they believe that Cartter not only overlooks the growth of the service economy, the expansion of leisure, and the use of higher education as a means of improving the quality of life; but he also fails to take full account of efforts to implement the ideal of equal opportunity to and through education. In summary, these sociologists maintain that Cartter's thesis of the overproduction of Ph.D.'s and his proposed response to this condition shift attention from the basic issues and problems in graduate education, which demand a reordering of national priorities, to issues that can be solved within the present political framework. The thesis postulated by the authors is that the problem Cartter has defined is one of political allocation of resources and is not one of too many people with too much education.

- Vetter, Betty

A Bubble in the Educational Pipeline (an Editorial)

Science, Volume CLXXVI, No. 4030, 9, April 7, 1972.

Enrollment figures for Fall 1971 reflect a substantial reaction among college-age students to scare stories about unemployed scientists and engineers. When overall graduate school enrollment was rising 2 to 5 percent (the latter includes the professional schools), enrollment dropped 2.7% in the physical sciences and 7.8% in engineering according to The Carnegie Commission on Higher Education. Undergraduate enrollment shows much the same trend, but the decrease in engineering was more severe (17.1% decrease in 1971, 1.7% decrease in 1970, and 2.4% decrease in 1969). Among the physical sciences, the undergraduate enrollment decrease in physics was the highest.

If these trends continue, fewer undergraduate degrees followed by graduate degrees can be expected to be granted in the years ahead, and this may bring supply and demand into better balance. It also could mean that if the national economy and a reordering of national priorities can enable us to convert needs into demands, the supply of technically trained specialists may again be too small in a few years.

Care in not overemphasizing the problem of displaced scientists and engineers, lest we diminish our future ability to meet our needs, is urged.

I N S T R U C T I O N A N D R E S E A R C H

DEGREES AND REQUIREMENTS; PROBLEMS PERTAINING TO THE DEGREE; ADMISSIONS; RESEARCH

• Abbott, Michael C.

A Graduate Student Looks at the 'New' Doctor of Arts Degree

AAUP Bulletin, American Association of University Professors, Volume LVII, No. 3, 364-367, September, 1971.

The author, from the viewpoint of a graduate student, examines the apparent strengths and weaknesses of the D.A. degree. He espouses that it may prove to be an unsaleable commodity and decries attempts to strengthen the distinction between teaching and research.

• Adams, Richard P.

The Outlook from the University (the Humanities)

Proceedings of the Tenth Annual Meeting. James N. Eshelman, editor. Council of Graduate Schools in the United States. Miami Beach, Florida. 41-43. December 2-4, 1970.

Contrary to those who believe the Ph.D. to be a very narrow, specialized research degree unsuitable for teacher preparation, Adams feels that Ph.D. degrees are and should be sufficiently flexible to accommodate the needs for which the D.A. has been suggested. Although the financial crisis in graduate education in the humanities is not as severe as that in the sciences, the job shortage for graduates is a definite problem. In order to remedy the situation, cutbacks may be required and should be made as follows: in those programs of dubious quality which were designed to supply the shortage of college teachers, and in the numbers of Ph.D.'s graduated from the greatly expanded programs of prestige institutions.

• Alpert, Daniel

The Relevance of Residence Requirements

Proceedings of the Tenth Annual Meeting. James N. Eshelman, editor. Council of Graduate Schools in the United States. Miami Beach, Florida. 71-77. December 2-4, 1970.

Alpert discusses the relation of residence requirements at the Ph.D. level to changes in undergraduate education and imminent technological revolution involving computer-based education--teaching by consoles spread over several hundred miles in a state or region. He considers the role of the doctoral student at the center of a university's intellectual life to be a vital one;

he feels it is necessary to have them in residence--they teach the teachers. He reviews their various functions in the university. Finally, Alpert suggests that the university can be a center of teaching, with remarkable geographical outreach, but cannot be a center of advanced learning without having in residence both faculty and graduate students who share a community of intellectual interest.

- American Association of State Colleges and Universities. Committee on Graduate Studies. Report of the Committee.

The Doctor of Arts Degree: A Proposal for Guidelines

American Association of State Colleges and Universities. Washington, D. C. February, 1970.

This report was prepared by the Committee on Graduate Studies and notes that the guidelines proposed are in close agreement with the recommendations of CGS and The Carnegie Commission on Higher Education. It presents arguments in favor and justifies needs for the D.A. degree as an alternative route to academic recognition and success; a road different from the Ph.D., particularly for those whose careers are in teaching. There is also the need to recognize that a rapidly changing society requires a specialized type of teacher--one who can synthesize knowledge, use the specialists' research for the advancement of man, and provide an important bridge for our public institutions in the multiple relationships they are developing with a wide variety of groups both on and off campus.

Guidelines and standards are developed for the D.A. degree along the lines of: requirements for admission to the program, selective retention, residence requirements, research experience, program of study, length of program, examinations, library resources needed, and faculty qualifications for offering and administering the program.

- Boddy, Francis M.

The Master's in Social Sciences and Humanities

Proceedings of the Tenth Annual Meeting. James N. Eshelman, editor. Council of Graduate Schools in the United States. Miami Beach, Florida. 52-57. December 2-4, 1970.

Boddy categorizes three levels of degrees as follows: the B.A., as general education; the M.A., as an all-purpose degree, with emphasis on professional and practice-oriented programs; and the Ph.D., as a degree certifying that the institution can do no more for a student, that any further education can best be attained by his own efforts. Boddy contrasts the "terminal" M.A. and that used as a stepping-stone to a Ph.D; the M.A.'s awarded by major Ph.D. institutions and those given by non-Ph.D. institutions. He discusses the tendency to view master's programs as manpower supply factories for specific needs to the exclusion of programs designed simply to answer students' intellectual curiosity.

- Bohm, Henry V.

  The Master's in Science and Engineering

  Proceeding of the Tenth Annual Meeting. James N. Eshelman, editor. Council of Graduate Schools in the United States. Miami Beach, Florida. 47-52. December 2-4, 1970.

  Bohm characterizes three kinds of master's degrees in science and engineering as the booby prize, the automatic, and the tough one. The first is awarded to those who simply cannot make it through the Ph.D., the second is given more or less en route to a Ph.D., and the third is a master's degree in the traditional sense, requiring a small Ph.D.-type thesis. Recently the trend in engineering has been to educate graduate students in a highly theoretical and esoteric set of problems, emphasizing the Ph.D., while a solid master's, directed toward the development and operating end of industry as opposed to pure research, has been downgraded. He discusses the development of engineering degrees hyphenated with social sciences, the trend toward part-time study at the master's level, and the indications that science and engineering students seem to be more satisfied with their graduate study than those in other fields.

- Brennan, Michael

  Research Component--Social Sciences and Humanities

  Proceedings of the Tenth Annual Meeting. James N. Eshelman, editor. Council of Graduate Schools in the United States. Miami Beach, Florida. 81-83. December 2-4, 1970.

  Brennan's postulate is simple: both the social studies and humanities have imitated the sciences in two respects--methodology and degree of specialization. The result has been an addiction to specialization for which he prescribes interdisciplinary programs of study and research.

- Bureau of College Education, State Education Department

  Masters' Degrees in the State of New York, 1969-70

  The University of the State of New York. Albany, New York. 1972.

  Authorized by Commissioner E. B. Nyquist of the State Education Department in 1969, this comprehensive study of first-year graduate study in New York was initiated and supervised by Richard J. Sawyer with the advice of a five-member ad hoc Committee to identify the status of master degree level education and to recommend ways to improve it. Fifty-six of the 82 institutions offering a master's degree in New York state were included in the study and these institutions completed a 21-page survey form to assess the character and status of their master degree programs. Supplemental data were collected on various aspects; staff members visited all of the institutions included in the report, and 22 visits were made by consultant teams.

The 91-page report outlines the conditions of the study in the initial section; discusses the five major topics covered--students, curricula, faculty, administration, and facilities; and concludes with an overview (Summary, Observations, and Recommendations) and the Appendices. The general overview gives insights into the weaknesses of the specific programs in terms of the major elements composing them. The report is critical of the rapid growth of masters' degrees in New York, a proliferation that was neither carefully planned nor controlled on a statewide basis. The programs are criticized for being loosely administered, poorly supervised, too often being of low quality, and for being inadequately evaluated. The massive influence teacher certification requirements have exercised on masters' degree programs and the wide use of undergraduate level courses in their programs are especially singled out for criticism.

The Commissioner, in the Foreword, mentions steps already taken or planned to improve the quality of graduate education, as a result of the study and states that further guidelines will be issued to strengthen and improve the quality of teacher preparation programs and the quality of masters' programs in the state.

- Cobb, Jacob E.

The Master's as Preparation for Teaching in Secondary Schools

Proceedings of the Tenth Annual Meeting. James N. Eshelman, editor. Council of Graduate Schools in the United States. Miami Beach, Florida. 57-62. December 2-4, 1970.

Cobb discusses how the master's degree became a necessity for a teaching certificate or for advancement in many states, and how it is practically mandatory for a teacher who plans to teach for more than three to five years. He reviews the problems which arise when teachers are certified to teach for a number of years and then are denied certification because they cannot be admitted to graduate school on account of their low graduating grades. Also considered is the idea of a five-year teacher preparation program, and of curricular integration in master's programs.

- Columbia Reports

Forthcoming Intermediate Degree to be Retroactive

Columbia Reports, 1-2. Columbia University. New York. June, 1972.

Columbia University expects to offer a new degree by February 1973 to graduate students who have completed all work for the Ph.D. except the dissertation. A qualified student may earn the degree by the end of the third year of full-time graduate study after completion of six residence units, receipt of an M.A., and the completion of other requirements as specified by the department concerned and the Graduate School. A student must earn the degree before the end of the fourth year. Unlike similar intermediate

degrees, Columbia's is temporarily nameless. It has the special feature of providing an "external route" to the Ph.D.--a route other than the traditional one of residence research at a university. At anytime within 10 years from the date of award, an intermediate degree recipient who has not continued his studies in residence may present an original, scholarly published work in lieu of the dissertation; if accepted, the applicant may sit for the examination for the Ph.D.

- Cooke, W. Donald

Research Component--Natural Sciences

Proceedings of the Tenth Annual Meeting. James N. Eshelman, editor. Council of Graduate Schools in the United States. Miami Beach, Florida. 77-81. December 2-4, 1971

Cooke states that, in regard to the research component of the natural sciences, "we have no need for any fundamental changes." He defends this position by quoting statistics from Ann Heiss' The Challenge to the Graduate Schools. He believes that this condition is the result of students needing the professors and the professors needing the students. Cooke does suggest more flexibility to allow interdisciplinary work and modification of the thesis requirement.

- The Council of Graduate Schools in the United States

Supplemental Statement on the Doctor of Arts Degree

The Council of Graduate Schools. Washington, D. C. December, 1971.

This is a revision of the first statement on the D.A. degree, issued by CGS in 1970, wherein the revised version reflects study and assessment of current trends and developments. Reasons for the degree, and guidelines and standards for establishing and administering the degree, are given under the headings of: rationale for the degree, institutional qualifications, characteristics of teaching scholars, control and organization, general requirements, academic content, professional components and internships, and research components. CGS views the D.A. as a degree to prepare professional, academically well-qualified teaching scholars for college classrooms. Experimental and evolutionary though the degree may be at this time, the single general standard which must prevail is that of high quality. The D.A. should be initiated only by institutions which have the physical and intellectual resources to offer advanced graduate study leading to doctoral degrees. The D.A. degree is not intended to replace traditional research or professional degrees, and the admission and retention of graduate students in the program should be as vigorous as for the Ph.D.

• Deener, David R.

Whither the Ph.D.

Proceedings of the Tenth Annual Meeting. James N. Eshelman, editor. Council of Graduate Schools in the United States. Miami Beach, Florida. 83-91 December 2-4, 1970.

Deener begins by sketching the historical development of the Ph.D. He sees the reshaping of the degree as being away from the standards of achievement and accomplishment and toward the standard of presumed potential. The dissertation is no longer an original contribution to knowledge but a demonstration of research skills. The author identifies three human forces that will shape the future of the Ph.D.: those holding the Ph.D., those who want the Ph.D., and those who must provide the money so that those who have the Ph.D. will teach those who want to get the Ph.D. Deener concludes that the Ph.D. will no longer be a terminal degree but merely an entrance certificate into various professions.

• Dillon, John A., Jr., et al.

Research and the Universities

Journal of Higher Education, Volume XLIII, No. 4, 257-266, April, 1972.

As graduate deans and members of the CGS Committee on Research, the authors analyze the role of research in higher education from the view of how it evolved and what circumstances must surround its continuance. The origins and methods of research are traced and defined; its role in the university setting and the moral and social implications of its results and support are reviewed within the context of the current climate.

They conclude and recommend from their study and analysis that four things must be done in the future: universities must maintain and support research in a balanced program with their teaching and research functions; federal support for research should be developed on a stable, long-term basis rather than on the basis of crisis; the main research activity of a university should be concentrated in the basic and applied areas rather than in development; and research should be unclassified so that the free exchange and student involvement, which are a university's greatest strength, will not be compromised.

• Dressel, Paul L., and Frances H. DeLisle

Blueprint for Change: Doctoral Programs for College Teachers

Monograph Eight. The American College Testing Program. Iowa City, Iowa. 1972.

This monograph provides a very complete and detailed analysis of the potential and promise of the Doctor of Arts degree. The study exposes the various attitudes of institutions and departments toward the D.A. degree,

citing the immediate need for a reassessment of the objectives of D.A. programs in relation to the roles and functions of college teaching and in relation to contemporary developments in undergraduate education in different types of institutions. Models and program mixes are detailed encompassing a three-year program based on professional components, an internship, and research components designed to meet the objectives of a professional doctorate for college teachers. Appendix A gives descriptions of some specific features of 11 Carnegie-Grant Doctor of Arts proposals and Appendix B gives the general profiles of 11 Carnegie-Grant Doctor of Arts proposals with commentaries. An extensive bibliography is given.

- Dressel, Paul L., and Sally B. Pratt

The World of Higher Education

Joseph Axelrod and Mervin B. Freedman, general editors. Jossey-Bass, Inc., Publishers. San Francisco. 1971.

This is an annotated guide to the major literature mainly centering on the identification of the essential elements needed in an institutional research library, but also including selections extending well beyond what can narrowly be construed as institutional research. The major topics covered include: institutional research as a field of activity; governance, administration, and management; students; faculty and staff; curriculum and instruction; research methodology; and related bibliographies and other reference materials.

It is recommended as a reference for a university office of institutional research because it covers the relationship between institutional research and major research done on higher education.

- Gardner, Eldon J.

Ph.D. Degrees in a Changing Scene

Graduate Education Today and Tomorrow. Leonard J. Kent and George P. Springer, editors. University of New Mexico Press. Albuquerque. 39-51. 1972.

This report suggests that in making changes in the training of Ph.D.'s, the programs must maintain theoretical foundations related to basic knowledge. To achieve more relevant goals in the graduate programs, Gardner cites the need for counseling of students with regard to employment prospects. He believes that there should be a critical scrutiny of Ph.D. students according to ability, personality, interests, and motivation for careers in teaching and/or research. He discusses the continuing need for federal support and various degree programs--a strong D.A. or a teaching Ph.D., a modified Ph.D., and the regular Ph.D. Better testing of prospective students needs to be carried out. He feels that Ph.D. enrollment trends are sagging or, at best, staying level.

• Harvey, James

Graduate School Admissions

Research Currents. (ERIC Clearinghouse on Higher Education, The George Washington University). American Association for Higher Education. Washington, D. C. November 15, 1971.

This review examines the factors related to student enrollment in graduate programs, the policies and procedures followed by graduate departments, and draws some implications for the improvement of the admissions process. Of particular interest are the suggestions for improving recruitment procedures and the improvement in the correlation of admissions criteria and graduate school success.

Improvement in prediction criteria is needed. The heavy reliance on the GPA is now in conflict with the pass/fail grading system. The Graduate Record Examinations Board has agreed to make changes in order to improve selection. Also, optional testing models for specific aptitudes or background knowledge, such as mathematics for science students, is suggested as being more appropriate for a particular graduate field. Further implications are: that letters of recommendation could be made more effective through use of scales of abilities; that questioning of undergraduate teachers on specific observable behaviors, for example, flexibility in research, would produce more useful information; and that follow-up studies of admitted students should be made.

• Hechinger, Fred M.

Ph.D.: It Has Become a Problem Degree

New York Times, July 19, 1970, Education Section, 1.

After reviewing the supply and demand factors regarding the Ph.D., Hechinger states that in the future the majority of doctorate holders will be employed either in two-year colleges or in state universities swollen by open enrollment. The author sees the development of the D.A. degree paralleling the Ph.D. in both respectability and stature.

• Heiss, Ann M.

Doctoral Education in Prestigious Universities

Volumes I and II. Final Report, U. S. Office of Education Contract No. OE-6-10-106, Project No. 5-0248-2-9. Center for Research and Development in Higher Education, University of California. Berkeley, March, 1970.

This study explored the nature of the contemporary university and appraised the organization, administration, and conduct of Ph.D. programs in

twelve departments of ten top-ranked universities. It investigated the faculty's perception of the university's nature; its social role in periods of crisis; its role in mission-oriented research and responsibility for the consequences of its research. Graduate deans, academic deans, department chairmen, graduate faculty and Ph.D. students also appraised their Ph.D. programs in terms of the programs' effectiveness in preparing future college and university teachers and researchers. Data were collected through interviews, questionnaires, policy statements, university catalogues, and departmental publications.

Important differences were found among graduate departments with respect to student and faculty satisfaction with the Ph.D. program. The restructuring of the degree process, curriculum improvement, better faculty-student relationships, and more adequate preparation for college teaching were indicated.

Volume I (391 pages) contains the body of the report; Volume II discusses the design of the study and contains 270 pages of statistical data on which the report is based.

- Koenker, Robert H.

The Doctor of Arts Degree

Paper presented at North Central Association Meeting, Chicago, Illionois, March 20, 1972. (Mimeographed.)

The author reviews the history and development of the D.A. degree, which is defined as specifically designed to prepare college teachers in breadth of preparation in a subject field; to develop the candidates ability to read, understand, interpret, and apply the results of research to teaching; and to prepare a dissertation directly related to college teaching. The D.A. degree is viewed as supplementing and not replacing the Ph.D. It concentrates on preparation for college teaching through courses and/or seminars in such areas as the psychology of learning, higher education, and present-day social issues and concerns, and through participating in an internship and/or externship experience.

Five factors are cited as leading to the establishment of the D.A. degree: the growing need for more teacher-scholars prepared at the doctoral level for undergraduate college teaching; the highly research-oriented and increasing specialization of the Ph.D. degree subject fields; student dissent partly due to poor teaching and supposed lack of interest in teaching exhibited by some faculty; the higher attrition rate of Ph.D. candidates, attributed in part to their frustration and lack of interest in their over-specialized preparation, excessive emphasis on research, and lengthy dissertation requiring several years to complete; and the decline in demand for Ph.D.'s in some fields, over-supply in some fields, and lack of job opportunities.

Common characteristics and differences between the Ph.D. and D.A. are compared and contrasted. Surveys conducted by Koenker in 1970 and 1971 show that a total of 92 universities are either currently offering (16), are planning to offer (11), or are considering the possibility of offering (65)

the D.A. degree. The fields reported most frequently using the D.A. were English (29), history (17), biology (13), mathematics (11), chemistry (6), physics (5), music (5), and government. art and economics. (4 each). The author concludes that it is too early to predict the success of the D.A. degree, but four factors are cited as supporting its potential success: the endorsement of the D.A. by a large number of professional associations; the relatively large number of universities offering, planning or considering the D.A. degree in spite of budetary limitations; the increasing need for junior college and college instructors who are specifically prepared to teach; and the increasing interest of graduate students in teaching rather than in becoming research specialists. The Ball State D.A. Program, which mainly follows the general pattern, is described in detail.

- Moreland, Henry Clifford, Jr.

A Follow-up Study of Recipients of the Doctor of Education Degree in Industrial Arts Education From Colorado State College

University Microfilms, Inc. Ann Arbor, Michigan. 1970.

Fifty graduates, 96.1% of those receiving a Doctor of Education degree in industrial arts education from Colorado State University during the years 1960-1968, returned a questionnaire designed to collect information about the effectiveness of the doctoral program in preparing them to function in their current positions. The study covered the graduates' backgrounds, views concerning their doctoral training in light of their professional responsibilities, and their suggestions and recommendations for the improvement of the doctoral program. Conclusions were: the majority of graduates were well pleased with the doctoral program in industrial arts; the philosophical scope of the department and doctoral program was somewhat limited to industrial arts; doctoral advisors were well qualified and competent, but their time for assisting was too limited; technical courses should continue to earn credit in doctoral programs; the majority of the doctoral graduates entered positions in the field of higher education, while some assumed administrative responsibilities; in general, the graduate faculty was excellent; and, finally, graduates considered their associations with other doctoral students and the faculty as the most valuable aspect of their doctoral program. This Ed.D. thesis was submitted to the University of Northern Colorado.

- Nelson, Jeffrey B.

Two-Year College Teachers in the Making

American Education, Volume VIII, No. 2, 21-24, March, 1972.

The career orientation of young graduate students is examined. Nelson finds that many of them increasingly reject both the "Ph.D. syndrome" connected with university teaching and the discipline problems that future high school teachers must face. As a result, teaching careers in community or junior colleges appear to be more attractive to them. An experimental master's degree program, now in the first year of evaluation at the State University of New York College at Fredonia, is described. This program seeks to determine

whether it is desirable or even possible to train persons specifically for teaching at the two-year college level.

- Orlans, Harold

  The Nonprofit Research Institute: Its Origin, Operation, Problems, and Prospects

  McGraw-Hill Book Company for The Carnegie Commission on Higher Education. New York. 1972.

  In this work, the ninth of a series of profiles sponsored by The Carnegie Commission on Higher Education, Orlans reviews the nonprofit research institute from the perspective of its origin, its operation, its problems, and its prospects. The agencies that have fostered research institutes (especially during the last half of the twentieth century), the impact of the 1969 Tax Reform Act on their operations, the effects of competition, the declining role of universities in institute management, the probability of success of institutes solving social problems, and the accounting institutes must provide if the federal government is to evolve an informed policy toward them, are critically examined and discussed. Trends and problems are highlighted in Part Four of the book and the chapters entitled "An Assessment" and "Recommendations" in Part Five are of special interest.

  The author suggests that the social upheaval beginning in the mid-sixties has had a profound effect on these organizations. As a result, their funding, organization, operation, and the very basis for their existence has been brought under critical scrutiny. Orlans argues that the public is concerned that technological development has been emphasized at the expense of solving social and economic problems. In response to this concern, many institutions are now diversifying their activities to include research in the social sciences as well as the natural sciences.

- Packer, Herbert L.

  Piling Higher and Deeper: The Shame of the Ph.D.

  Change, Volume II, No. 6, 49-53, November-December, 1970.

  Packer views American higher education as being in a complete shambles. He perceives the structure of the Ph.D. degree, the time factor, and research requirements with great skepticism. He sees these factors forming a never-ending cycle. In place of the present system, he would substitute a program centered around an intern or externship in the student's specific field.

- Rees, Mina

  Chairman's Address

  Proceedings of the Tenth Annual Meeting. James N. Eshelman, editor. Council of Graduate Schools in the United States. Miami Beach, Florida. 7-12. December 2-4, 1970.

  Mina Rees discusses two major questions to be considered in the future of graduate education: the whole range of practitioner's degrees, such as the Doctor of Arts, and the way in which the graduate school system organizes itself to handle diverse problems.

- Rees, Mina

  Graduate Education--a Long Look

  Graduate Education Today and Tomorrow. Leonard J. Kent and George P. Springer, editors. University of New Mexico Press. Albuquerque. 139-151. 1972.

  The author points to changing trends in graduate education as more and more graduates assume the role of practitioners. It is suggested that there are some implications for style and graduate school requirements in the need for expanded attention to research on problems of the real world, and, in particular, the world in the neighborhood of each university. The Ph.D. may reflect regional needs while still conforming to the basic degree requirements. There is a need to allow for part-time study, a relaxation of residence restraints, problem-oriented research, and internships. Rees also advocates some intermediate degree, such as a Master of Philosophy, and some name for the A.B.D. that would recognize real achievement but allow the holder to go about his business without bothering about a dissertation. Perhaps the dissertation could be done at a later time when field experience would render it more meaningful. The author recognizes the continued need for pure scholarship and the need to provide the background and opportunity to make this possible, but also recognizes the need for more flexibility in graduate school programs.

- Sanders, Howard J.

  Two-Year Master's Program in Engineering

  Chemical and Engineering News, Volume L, No. 20, 15-16, May 15, 1972.

  Starting in September 1972, Carnegie-Mellon University will launch two-year master's programs in engineering, specializing in either environmental studies or processing. Engineering design is also being considered. At least 75% of the master's students are expected to continue to follow the one-year curriculum. Carnegie-Mellon has had two-year master's programs in industrial administration (for 20 years) and in urban and public affairs (since 1970). The majority of the students are expected to be in chemical and mechanical engineering. Emphasis in the two-year program will be placed

on problem solving and projects with a large amount of interaction between the students and engineers and scientists in outside, nonacademic institutions. These experts will direct the students in realistic problems, thus helping to meet the need for technically trained people skilled in environmental improvement or processing. The new degree will not sacrifice the solid technical content found in the conventional one-year curriculum, nor is it intended to be a stepping-stone to a Ph.D. Although the Ph.D. will continue to be valuable for those in research and teaching, it should not be viewed as the highest desirable goal for all qualified students. Rather, the new degree will be an alternative to the Ph.D.

- Stever, H. Guyford

  Doctor of Arts Degree (Editorial)

  Science, Volume CLXX, No. 3958, 587, November 6, 1970.

  From the vantage point of the experience with the D.A. degree at Carnegie-Mellon, Stever describes the rationale for the degree, and noting its slow acceptance, calls for broader support.

- Wilson, Kenneth M.

  Of Time and the Doctorate--Report of an Inquiry into the Duration of the Doctoral Study

  SREB Research Monograph No. 9. Southern Regional Education Board. Atlanta, Georgia. 1965.

  This report covers a variety of factors considered to have a substantial prolonging influence on the time lapse between the conferral of the B.A. and the Ph.D. The statistics cited in this BA-PHD time lapse study covered the period 1950-1959; an area of 16 states in the SREB region; and the responses of 1,929 Ph.D.'s in over 120 graduate departments in 20 institutions in 15 doctoral fields, 25 graduate deans, and 100 representatives of graduate departments. At least 20% of the respondents cited the following factors as having a lengthening influence: discontinuity of attendance, work as a teaching assistant, the nature of the dissertation problem, writing the dissertation off campus, financial problems, inadequate preparation in foreign languages, lack of coordination between beginning and advanced stages of graduate work, family obligations, inadequate undergraduate preparation in the major field, and transferring from one graduate institution to another.

  The statistical analysis showed that for the typical graduate in the study sample, conferral of the Ph.D. came 7.5 years after conferral of the B.A. and 6.1 years after entry into graduate school. The majority (87%) earned a master's degree en route to the doctorate and par for the MA-PHD course was 4.5 years. The average graduate was "in attendance" at a graduate institution for a total of 3.5 years. Eighty percent had some full-time employment during the predoctoral period--mostly in the form of professional work. The average age at the time of degree conferral was 30.8

years of age. Variations in the time lapse were least for the physical and natural sciences (5 to 8 years) and greatest for the social sciences and humanities (9 to 13 years). Only 37% had a graduate degree goal at the time of B.A. conferral.

- Wiltsey, Robert G.

Doctoral Use of Foreign Languages: A Survey

Parts I and II. Graduate Record Examinations Board, Educational Testing Service. Princeton, New Jersey. 1972.

This publication summarizes the highlights of a survey conducted under the aegis of the GREB in the fall of 1970. The survey questionnaire was sent to about 16,500 doctoral recipients who had earned their degrees between 1959 and 1969 in 18 academic fields. The sample in each field was deliberately weighted (two to one) in favor of those who had earned their degrees between 1959 and 1964 because of their greater experience. A total of 11,615 usable questionnaires were returned for a 70% response rate. The data reported were analyzed for: the total group; broad areas of natural sciences, social sciences, and humanities; 18 individual academic fields; and the two five-year periods during which the degrees were earned. The full report consists of two parts--a detailed report of the study including highlights, a review of the literature, a description of the procedures used, major results and discussion (Part I) and complete tables of results (Part II). The Reports should be consulted for the full findings, but among the salient highlights were: respondents in the humanities were the most receptive toward the language requirement and those in the social sciences the most opposed to it; the findings support the argument for making the language requirement a departmental option; French, German, Spanish, and Russian were used most frequently in satisfying the requirement; 59% indicated they used their doctoral language in their doctoral studies and 61% reported using them after completing their degrees; and of those who knew and used foreign languages for professional purposes, 36% felt that they were essential and 49% felt they were helpful; 66% were in favor of retaining some type of requirement, but 32% were for individualizing the requirement for each student; 27% felt that the requirement should be eliminated and the majority of the doctorates in economics, education, psychology and sociology indicated no need for a foreign language.

- Windle, J. L. et al.

Review of Research: Career Planning and Development, Placement, and Recruitment of College-Trained Personnel

Sponsored by the CPC Foundation and the Midwest College Placement Association. College Placement Council, Inc. Bethlehem, Pennsylvania. 1972.

Supported by the CPC Foundation and the Midwest College Placement Association, the objective of the authors was to develop a publication based

on a systematic review of the research literature in the areas of career planning and development, placement, and recruitment of college-trained personnel. The aim of the publication was to stimulate further research utilization of the results of existing research.

From over 1,000 studies which were identified, only 201 met all of the selection criteria. These were reviewed and evaluated and the results presented in the form of a research abstract. Several important objectives were achieved: first, after reviewing the material, the subject matter was put into perspective; secondly, the system identifies areas that require further research.

PROGRAMS (INCLUDING SPECIAL, CONTINUING EDUCATION, EXTERNAL DEGREES, ETC.)

- American Society for Engineering Education

Engineering Education, Parts 1 and 2

American Society for Engineering Education. Washington, D. C. March, 1971.

The first part of this two-part volume includes articles relating to engineering education. Topics included are personalizing instruction, individualizing instruction, programmed instruction, rewarding good teaching, and the use of different approaches to improve teaching. Part two contains descriptive data from 201 engineering colleges concerning: program and degree requirements, personnel, thesis topics, enrollments, degrees granted, areas and dollar volume of research, and sources of research support.

- Arnold, Joseph P., editor

A Seminar on Graduate Education Programs

Leadership Training Series No. 30. Center for Vocational and Technical Education, Ohio State University. Columbus, Ohio. September 29-October 2, 1969.

To provide an opportunity for communication among selected personnel in vocational and general education, 19 university, state and federal officials, and specialists attended a four day seminar designed to: identify leadership roles and competencies; identify and describe social and behavioral science elements as they apply to vocational and technical education; explore ways to optimize interinstitutional cooperation in graduate programs; and recommend ways to improve graduate education programs for vocational and technical education leaders. To accomplish seminar objectives, major papers were presented by R. N. Evans, G. L. Mangum, and J. K. Little. Several participants prepared brief reactions to the papers, and one day was devoted to discussion of crucial problems facing doctoral graduate students in vocational and technical education, with recommended solutions. A summary of significant events and activities, and texts of the major papers are included.

- Arrowsmith, William

  The Shame of the Graduate Schools: A Plea for a New American Scholar

  Harper's, Volume CCXXXII, No. 1390, 51-59, March, 1966.

  This classical scholar argues that the present graduate system in the humanities is a great misuse of talent and has little pertinence to the real needs of man. He believes that at present the sole purpose of graduate schools in the humanities is to produce more and more researchers and graduate professors and that this graduate emphasis has corrupted and restricted the undergraduate curriculum. Arrowsmith also believes that the humanities suffer less from a lack of funds than from a lack of organizational intelligence and committed action. He deplores the "publish or perish" approach and conventional humanistic research, and evisions the university where the great teacher has equal honor with the great scholar. Within this utopian setting, creative emulation leads to changes in curriculum and degrees.

- Dressel, Paul L., and Frances H. DeLisle

  Educational Specialist Programs in Higher Education

  Office of Institutional Research, Michigan State University. East Lansing. March, 1970.

  This study is concerned both with the examination of current policies and practices relating to sixth year educational specialist programs and with clarifications of interrelationships to other degrees and programs. Chapter one discusses the factors contributing to the development of sixth year graduate programs. Chapter two presents the rationale and organization of the study. Chapter three reports the characteristics of the educational specialist programs, program planning principles, and program comparisons. Chapter four compares the program patterns of 137 professional specializations and 12 intermediate degrees with the educational specialist program pattern. Chapter five presents brief summaries of educational specialist programs in different institutions to illustrate the variety of program offerings. Chapter six concludes with the current dimensions, program variables, strengths and inconsistencies, with some recommendations for educational specialist program evaluation and reform. The epilogue describes the reactions and recommendations of the researchers. Appendix One discusses some of the difficulties imposed by the sources used (graduate school catalogs and bulletins). Appendix Two contains the tables.

- Drucker, Daniel C.

  Is the Future Bright or Bleak?

  Midwest Engineer, Volume XXIV, No. 3, December, 1971.

  The author examines critically the current role of the engineer and centers his discussion on four present and emerging points of agreement about

engineers which he terms "disastrous nonsense." These points of agreement are: we should discourage engineering students and engineers from going on to graduate school, and particularly doctoral study, since there will be little demand for them; professional schools of engineering should be established in which students would enter in their junior year, and in which engineering practice rather than research would be emphasized; all engineers should be sufficiently exposed to the useful social and behavioral sciences in order to solve. upon graduation the pressing social and political problems of society; and the traditional American goal of unlimited educational opportunity for all who can qualify should be abandoned because we have come sufficiently close to achieving that goal.

Drucker argues against all four positions and against narrow specialization within the field of engineering. Finally, he points out that the higher the level of education for any given group, the lower the level of unemployment for that group.

- Hadley, Paul E.

The Role of the Graduate School in Continuing Education

Proceedings of the Fourteenth Annual Meeting. Western Association of Graduate Schools. Tempe, Arizona. 107-113. March 5-7, 1972.

This paper highlights public service, the third responsibility of American universities, and the special role that the graduate school has in fulfilling this mission through programs of continuing education designed "to integrate education into an enriched experience throughout a lifetime." Current efforts to provide this service, the problems encountered, including those of credit and accreditation, are reviewed, and the need for an all-university council on graduate studies to actively administer graduate continuing education in its broadest context is recommended. Graduate schools are exhorted to accept the challenge of the pressures of the times and to provide responsible direction in bringing about the changes required.

- Hawkridge, David G.

The Teaching of Science to Students at a Distance

Paper presented at the Annual Conference of the American Association for the Advancement of Science, Chicago, December 27-30, 1970.

The University of Great Britain will soon open, with an enrollment of 25,000 students. Within three years, 40,000 undergraduate students are expected. The instructional system of the open university is unique: it employs a multimedia approach and stresses the interdisciplinary nature of the foundation courses; weekly radio programs and open-circuit television programs will give support to the course work; and part-time class tutors will give regular tutorials at 250 local study centers scattered throughout the country. The open university was established for social, political, and economic reasons: to give a second chance to adults who were eliminated

by the highly selective secondary system in Great Britain. This chance can be given more economically through the open university than through a conventional British university. The implications of teaching at a distance depend on the country in which it is happening. In developing countries it may afford a short-cut to a higher education; in the United States, where educational opportunities are more liberally provided, it may represent an alternative to be taken by those who prefer it.

- Koen, Frank, and Stanford C. Ericksen

An Analysis of the Specific Features Which Characterize the More Successful Programs for the Recruitment and Training of College Teachers

Final Report on Project No. S-482, U. S. Office of Education Contract OE-6-10-227. The Center for Research on Learning and Teaching, the University of Michigan. Ann Arbor. 1967.

This report is the result of research performed under with the Office of Education. It provides: a report of recruitment activities in a number of prominent institutions; a factual summary of the administrative, formal, and substantive features which are characteristic of the more active training programs in some 40-50 universities; and a description of a general model for a training program which might emerge from an integration of the most progressive aspects of the programs studied. Methodologically, a mail survey was conducted and several universities were selected for on-site visits; previous studies were also consulted. Despite a considerable degree of variation in programs and pronounced lack of information by the universities, Koen and Ericksen conclude that two factors were frequently noted by respondents as acting to inhibit the development of training programs. The first was the lack of a broad-based faculty interest in the training-supervision role; the second was the shortage of available staff time for carrying out the demanding tasks of developing competent teachers from the graduate student body.

- May, William W.

Changing Patterns of Graduate Education: One Suggested Model

Graduate Education Today and Tomorrow. Leonard J. Kent and George P. Springer, editors. University of New Mexico Press. Albuquerque. 100-110. 1972.

The paper discusses, as an alternative model for doctoral degrees, an urban studies graduate program at the University of Southern California. The breach with tradition occurs not so much in structure as it does in shaping a program around a perceived problem area. There are several unique features in the components of the program: the selection of only mature students with master's degrees, or the equivalent, in various disciplines; a two-year sequence of core seminars providing opportunities to work with students and faculty who have widely different perspectives and skills; a group research project; and a highly individualized study program to meet the needs and interests of the student. The traditional components of

foreign language, research methodology, examinations, and dissertation are retained. Several points gained in the experience of developing alternative programs in the doctoral area are: new programs are likely to develop through modest variations in structure rather than through radical breaches; it is easier to introduce changes in content than in structure; and each new graduate program must be able to meet tests applied to traditional programs concerning the academic content and research orientation.

- Miller, Paul Van R.

Cooperative Graduate Program for Training in Educational Research

Final Report, U. S. Office of Education Contract No. OEG-0-8-061757-3646(010), Project No. 6-1757. Office of Research, Lehigh University. Bethlehem, Pennsylvania. March, 1971.

The cooperative graduate program for training in educational research at Lehigh University continued for the fourth year during the grant period of September 1, 1969 through August 31, 1970 without substantial change. The program objectives were to prepare students to function effectively as specialists in educational research and measurement in the public schools, to evaluate educational programs, to initiate and carry out studies and report findings in a clear and objective fashion, and to act as research resource persons to other professionals in the schools they serve; to foster an intelligent dependence on research as a means of making educational decisions on the part of school personnel and to have them look to the university and its graduates for guidance in relevant situations; and to qualify trainees for the Ed.D. degree with a specialty in educational measurement and research. During the twelve-month period of the grant, 12 trainees were supported by federal funds in the doctoral program. Of the 12, all completed the course work requirements, met all the examination requirements and satisfied the residence requirement. Four received the Ed.D. degree. Of the balance, all but one were engaged in writing the dissertation, and it was anticipated that the degree would be awarded in 1971 in seven of these eight cases.

- National Science Foundation. Division of Science Resources Studies. Science Education Studies Group

Changes in Graduate Programs in Science and Engineering 1970-72 and 1972-74

Science Resources Studies Highlights. NSF 72-311. National Science Foundation. Washington, D. C. July 21, 1972.

During 1970-72 the ratio of net additions in doctoral programs in science and engineering to existing doctoral departments in these areas of study was 4%, or 1 to 26. However, current plans for the 1972-74 period indicate that this rate of growth will be cut by about 50%, or 1 to 66. The "top twenty" universities showed no net change in science and engineering doctoral programs in the 1970-72 period; the "developing" universities showed a net increase equivalent to about one change per two universities,

while the "intermediate" universities showed the largest relative net increase, equivalent to about one change per one and one-half universities. Planning for the 1972-74 period indicates, again, no change for the "top twenty" and the largest relative increases in doctoral programs among the "developing" universities. During the 1970-72 period the greatest increase in doctoral programs occurred in computer science and psychology. In plans for 1972-74, computer science again emerges as the field with the greatest expected relative increase.

The reasons given most often for adding new doctoral programs were the development of a new field and the national job market. Other reasons frequently cited were institutional long-range plans, quality of existing faculty, student pressure, and faculty wishes. The reasons most often given for elimination of programs was lack of student interest, budgetary considerations, quality of existing faculty, and faculty wishes.

A net increase of 256 master's programs in science or engineering (equivalent to one per three institutions) was reported for the 1970-72 period; half as large a net increase is planned for the following two years. Relating these increases to the total number of master's departments in science and engineering shows the 1970-72 increase to be 1 program for every 23 departments and the planned 1972-74 increase to be 1 for every 46.

- Noonan, John P., editor

Designing Doctoral Programs in Education

Bureau of Educational Research and Service. Tennessee University. Knoxville. 1968.

This report contains nine speeches presented at a conference on designing doctoral programs in education held at Kansas State University on June 28-29, 1968. Titles included are: "The Role of Doctoral Programs in Today's and Tomorrow's University"; "Trends in Student Personnel Work: Implications for Graduate Education"; "Research Training in Doctoral Programs in Education: Why, What, and from Whom?"; "Designing Curriculum and Instruction as Part of Doctoral Programs in Education"; "The Doctoral Program for Specialists in Curriculum and Instruction"; "Counselor Education"; "Changing Roles and Performance of the Superintendent"; "Designing a Doctoral Program in Educational Administration"; and "New Designs for Adult Education Doctoral Programs."

- Pappas, Edward John

The Doctorate in Speech

University Microfilms, Inc. Ann Arbor, Michigan. 1967.

The purpose of this study was to determine what has happened, is happening, and should or may happen to doctoral programs in speech. The study included a review of doctoral education in America and a discussion

of early standards and policies. The 44-year period of the doctorate in speech, 1922-1965, was reported with special attention to the early institutions and doctoral recipients. Chapter IV examined the active doctoral institutions. Chapter V considered those aspects of doctoral education which related to students and programs. The final chapter offered conclusions, recommendations, and a suggested program of future research. The annual index published in Speech Monographs by Franklin Knower was used as the initial basis for selecting the institutions to be studied. The study revealed: a predominant German influence on the early doctoral programs; a total of 3,067 doctorates in speech and 38 active doctoral institutions in speech; a trend away from large multi-area departments; a majority of doctoral students receive financial support; training research scholars and teachers are the chief tasks of the doctoral programs in speech. Recommendations included: a new index for more precise viewing of the development of programs is needed; and better methods of familiarizing students with available doctoral programs in speech must be devised. The study urged further exploration into doctoral education in speech and offered a recommended program for future research.

- Van Dyne, Larry A.

  External Degree Programs Give New Life to University Extension

  The Chronicle of Higher Education, Volume VI, No. 33, May 22, 1972.

  A new generation of university reformers have suddenly rediscovered the touted virtues of "lifelong learning," particularly in the external degree movement; most seem to forget that this is what university extension has been about for years. The formation of a blue ribbon Commission on Non-Traditional Study has climaxed a series of events and reports: Great Britain's Open University for Adults, New York's Empire State College and external degree, the Newman Report, the Assembly on University Goals and Governance of the American Academy of Arts and Sciences, and the Carnegie Commission--all advocate the traditional mission of the Extension Services. Suddenly, extension education, that formerly held third class status on most campuses, is in the limelight. The external degree is the most glamorous of the so-called new innovations aimed at the off-campus student, yet there is a consensus among most extension people that much of the continuing education business of the future will not be degree-oriented, but instead there will be growing interest in "contract programs"--specifically designed courses and curricula that do not lead to formal degrees.

- Van Dyne, Larry A.

  External Programs Can Maintain Quality, UCLA Dean Asserts

  The Chronicle of Higher Education, Volume VI, No. 33, May 22, 1972.

  Recent concern that the external degree programs, unless carefully designed and carried out, might lead to an erosion of academic standards has been expressed. At the annual meeting of the Extension Association,

Leonard Freedman, Dean of Extension at UCLA, admits the legitimacy of some of the criticism but defends the external degree concept and urges respect be paid to concern about deterioration of standards. Mr. Freedman responds to the six major questions, all related to quality, being raised by the critics and attempts to counter the arguments. He concludes that external degrees will not be a cheap alternative to the conventional programs, particularly if high quality is to be maintained, and new technologies are to be fully utilized.

- Veri, Clive C.

Building a Model Doctoral Degree Program in Adult Education

Paper presented at the Annual Meeting of the Professional Training and Development Section of the Adult Education Association of the U. S. A., Atlanta, Georgia, October 29, 1970.

Following an historical discussion of graduate study in adult education, four models designed for a graduate study program since 1960 are discussed and illustrated. The models are: the Essert model, comprised of three concentric circles consisting of core, augmentation, and specialization courses; the Knowles model, comprised of two concentric circles consisting of core characteristics and optional characteristics; the Nu model, comprised of three overlapping circles consisting of administration, teaching, and research; and a theoretical model, a model for the education of professional adult educators, proposed by the author, comprised of a flowchart concerning the student and an advisory committee.

- Wenglinsky, Martin

Reform in Graduate Education: A Proposal

Journal of Higher Education, Volume XL, No. 7, 534-542, October, 1969.

Wenglinsky finds disadvantages to the existing graduate programs in general and to graduate education in sociology in particular. These disadvantages include: no real "cumulativeness," a similarity to undergraduate work, the nature of the relationship with the faculty, a lack of practicality, teacher-assistantships training, and the time factor. He suggests that educators model graduate schools on professional schools, which do not have these problems because of the cohort method.

The author proposes a new program that would consist of three continuing sets of seminars, broadly grouped around three kinds of activities which sociologists engage in: a seminar devoted to doing studies, one engaged in the cultivation of sociological tools of analysis, and a third devoted to the exploration of a substantive area. Wenglinsky argues that this method would be more flexible and beneficial to both the student and the discipline without radically effecting costs.

• Zuckerman, Harriet, and Robert K. Merton

Age, Aging, and Age Structure in Science

A Theory of Age Stratification. Volume III of Aging and Society. Matilda White Riley, Marylin Johnson, and Anne Foner, editors. Russell Sage Foundation. New York. 292-356. 1972.

In this essay the authors recognize the conception that science goes beyond cognitive structure and technological apparatus to include the "social system" of science. They utilize this conception to broaden understanding in two major directions: the sociology of science and the sociology of age stratification. They develop new theoretical statements and fresh evaluations of available evidence on such subjects as the relation between the growth of science and the age structure of the scientific population. They show how both historical trends and the socially patterned process of aging enter into the allocation of teaching, research, and administrative roles in science. The basic idea is advanced that inquiry must deal not only with the age hierarchy in distribution of powerful postions, but also with the consequences of this age structuring of power for younger scientists, for the accumulation of scientific knowledge, and for the relation of science to social policy. They illustrate the diverse ways in which the process of socialization intermeshes with processes of aging and cohort succession to affect the structure and culture of science.

S T U D E N T S

ATTITUDES, CHARACTERISTICS, UNREST

• Bayer, Alan E., and Alexander W. Astin

War Protest on U. S. Campuses During April, 1972

Higher Education Panel Survey No. 9. American Council on Education. Washington, D. C. May 9, 1972.

From a 100% response to a national sample survey of 242 representative institutions, selected as members of the ACE Higher Education Panel, it was found that anti-war demonstrations on campuses in April were less violent but more numerous than protests that followed U. S. Military action in Cambodia in 1970. Overall, the relative comparison was that demonstrations occurred on 27% of the campuses this April following the renewal of U. S. bombing raids on North Vietnam, while these occurred only on 16% of the nation's campuses after the 1970 Cambodian invasion. The April disturbances appeared to be concentrated in the larger universities and more selective colleges; less than 18% of the smaller institutions experienced protests, and fewer than 10% of the predominantly black institutions. Regionally, the percentages of institutions reporting incidents were estimated as follows: Northeast--38.5%, Midwest--25.3%, Southeast--14.4%, and West and Southwest--29.7%. The researchers found that destruction of property in April was rare, and that police or National Guard units were called to fewer than 20 campuses; arrests or injuries occurred on fewer than 10.

• Keniston, Kenneth

What's Bugging the Students?

Educational Record, American Council on Education, Volume LI, No. 2, 116-129, Spring, 1970.

This article was prepared at the request of the American Council on Education's Special Committee on Campus Tensions. The author analyzes student unrest and offers nine recommendations for responses "to the grievances of those who believe their interests have been neglected." He believes that it is crucial, both ethically and politically, to solve the causes of unrest which may lead to public backlash in funding caused by a disenchantment with the "products" of higher education.

The recommendations conclude: only major changes in national policies can change the rage and disaffection of the excluded and activists: American higher education must learn to tolerate and perhaps encourage conflict and develop new mechanisms for its on-campus expression; the institutions must develop channels for interrupting, discontinuing, and resuming higher education, thus encouraging students who do not want what college has to offer to seek valuable and relevant expression elsewhere; colleges and universities should not try to be all things to all men; colleges and universities should increase their autonomy and independence, resisting

pressures from students and faculty to become political agencies for social change or executors of government or military policies; more student participation is needed in college and university governance; colleges must seek a "mix" of student types leading to an atmosphere of diversity, openness, and respect; the needs, grievances, and tensions of that "silent majority" of college students that views education in vocational terms should not be slighted in the rush to respond to the urgent demands of the excluded and activists--many nonvocational students would prosper more in college if they were to work elsewhere and return with more definite educational goals; and student political involvement should be encouraged through the vote, but the right of students to be "apathetic" should be respected.

- MacNair, Ray H., and William Siembieda

Interdisciplinary Research Relating Community and College Activities, Final Report

Tuskegee Institute. Tuskegee, Alabama. November, 1970.

This study of graduate student socialization in departments of political science is based on data collected in 14 departments of broadly representative Ph.D.-granting institutions in the U. S. All students and faculty in all departments were sent a questionnaire asking about their attitude toward the profession, their program of study, their relations with others in the department, and academic values. The mean values of student and faculty responses were correlated, and analyses were made of departmental, as well as individual differences. There appeared to be two "pure" types of departments. Type I departments had a high rate of interaction between students and faculty, accurate perceptions between the two groups, high morale on the part of the students, and relatively high disagreement between students and faculty on substantive and political matters. These departments also had higher student satisfactions with the relevance of their graduate training. Type II departments were the opposite in each case. Type I departments provided an environment that supported differences between faculty and students, while the hierarchical structure, lack of communication, and low morale in the Type II departments led to conformity on the part of the students.

- Meyerson, Martin

The Ethos of the American College Student: Beyond the Protests

The Contemporary University: U. S. A. R. S. Morison, editor. Houghton Mifflin Company. Boston. 266-291. 1966.

The author concludes that the rapidly expanding college enrollments reflected in education for the majority, the increasing strain of being neither the elect nor the electorate, current frustrations and dissatisfaction with the educational system and society, have led to student activism and revolt.

EVALUATION AND RESEARCH ON STUDENTS' PERFORMANCE

- American Political Science Association. Graduate Board Examinations Board Panel of Review

  Assessing Candidates for Graduate Study in Political Science

  P.S., Newsletter of the American Political Science Association, Volume II, No. 4, 604-621, Fall, 1969.

  In recent years it became apparent that many political science departments were not making use of the Graduate Record Examinations Board's Advanced Test in Political Science. Some graduate advisors suggested that revisions in content or approach would make the Advanced Test more useful for admissions decision and perhaps also for other purposes such as diagnosing the strengths and weaknesses of students already in progress toward a degree. In 1968 a committee of the American Political Science Association was appointed to "review ... the Graduate Record Examination in political science and to propose changes in the design of the test which would make it acceptable and useful to graduate departments."

  The report reviews the makeup of the past test, the nature of the graduate admissions decision, the effectiveness of the test, the nature of the test itself, and the sub-score option. The panel came to five recommendations: that the Advanced Test consist of two parts: first, a general section; second, a specific "field of knowledge"; that graduate departments undertake studies of their admission procedures and, in particular, evaluate the performance of their students with reference to their test scores and admissions procedures; that a panel be created to study undergraduate curriculum; that the lag between changes in the field of modification the test be reduced; and that a study should be undertaken to determine a design test that would assess the ability of the student to do research.

  Appended to the article are the statistical results of the survey conducted.

- Burns, Richard L.

  The Future of the Graduate Record Examinations Program, A Working Paper

  Graduate Record Examinations Board. Educational Testing Service. Princeton, New Jersey, 1969.

  This working paper provides a rationale for changes in the nature and structure of the GRE Program. It is proposed that the strengths of the current program be retained and broadened by implementing the following suggestions: the Aptitude Test would be retained but reduced in length to produce a Verbal and Quantitative score of the same value and on the same scale as current scores; the additional time gained would be used to provide optional tests which would measure other aptitudes or achievements of importance to certain disciplines; the Advanced Test would be extended 15

minutes in length and would provide for pretesting, and the Committee of Examiners responsible for the tests would have the option of producing a test essentially like the one now developed with total score only, or of developing a test which yields subscores in addition to total score or of structuring the test so that all testees are examined on a core of common material on which a score would be reported and in addition having each student choose an optional subtest in some specialized aspect of the discipline for which an additional score would be reported. Guidelines have been prepared to aid Committees in considering the choices and to provide other information.

- Educational Testing Service

New Needs, New Responses: Annual Report 1969-71

Educational Testing Service. Princeton, New Jersey. 1972.

This two-year report marks the period of transition between the retirement of Henry Chauncey, the first president of ETS, in 1970 and the appointment of William Turnbull as the second president of ETS. Most of the report focuses on activities related to five broad areas of change envisaged by Turnbull as particularly significant for measurement: recognition of the importance of the early years of life for intellectual development; awareness of the importance of providing fuller information to students and parents about the progress of the individual learner and the educational and occupational options available to him; the search for ways to relate education and measurement, at all levels, more directly to the needs and aspirations of representatives from minority groups; attempts to encourage independent study in post-secondary education, including more flexible approaches to learning, off-campus study through credit by examination, external degrees, and expanded programs of continuing education for adults; and new emphasis on the importance of assessment and evaluation of educational programs related to accountability and effectiveness.

Turnbull envisages two somewhat interrelated directions of change in the perception of the role of ETS: a responsibility to expand its teaching function and a broadened concern with basic educational problems and their solution through research and measurement techniques.

- Flaugher, Ronald L.

Testing Practices, Minority Groups, and Higher Education: A Review and Discussion of the Research

Educational Testing Service. Princeton, New Jersey. June, 1970.

This paper reviews some of the specific issues that underlie the controversy concerning the use of objective tests by institutions of higher education and how this use affects the selection and attendance by members of minority groups or persons designated "disadvantaged." Following a discussion of the issues, a review of the literature attempts to reveal what is known about each of them; this is followed by some suggestions for future research efforts.

It is concluded that the research evidence indicates: members of minority groups may be expected on the average to score less well on most types of objective tests, but contrary to popular impression the cause of this discrepancy, at least for black examinees, does not appear to be the verbal component; validity studies that have been conducted indicate that the usual sort of academic aptitude measure predicts equally well for black and white college undergraduates; in some instances there has been overprediction of actual grades, or other nonacademic type of criteria, instead of the anticipated underprediction; there is sketchy but provocative evidence to indicate that the test atmosphere, both physical and psychological, can influence the quality of performance; and some research is beginning to document the existence of differential patterns of ability in minority groups, which suggests that testing should sample a wider range of abilities than the present aptitude instruments cover. Pertinent references are cited.

- Graduate Record Examinations Board

Report on GRE Restructuring

GRE Board Newsletter, No. 9, 1-3, January-February, 1972.

This is a progress and status report on the GRE Board's plan, approved in March 1960, to restructure the GRE tests. During 1970-71 all of the Committees of Examiners met to consider the options open to them for the Advanced Tests and the option they preferred for students in their discipline as a possible addition to the Aptitude Test.

Nine disciplines have elected subscores plus total score (biology--3 engineering--2, French--2, geography--2, geology--3, history--2, music--2, psychology--2, and Spanish--3); the other disciplines not electing subscores will continue to offer a total score, but it is possible that subscores will eventually be generated for some fields depending on studies to be conducted; none of the Committees chose the core plus option approach.

Plans to restructure the Aptitude Test were held in abeyance because of difficulties and problems encountered, the results of certain research findings, and pending further study and review of other possibilities. For the moment, the Program will continue to offer the Aptitude Test yielding a V and Q score as in the past and no additional scores will be generated for the Aptitude Test.

- Lannholm, Gerald V.

Summaries of GRE Validity Studies 1966-1970

Graduate Record Examinations Board Special Report No. 72-1. Educational Testing Service. Princeton, New Jersey. February, 1972.

This report complements and extends GRE Special Report No. 68-1 by summarizing 14 additional studies, which in general resemble in method and

types of data employed most of the prediction studies summarized in the 1968 report.

The results varied considerably from one study to another and among subject fields, but the following conclusions appear warranted: in most cases, both the undergraduate record and the test scores are positively related to the performance in graduate study, and taken together these two factors usually result in more effective prediction than either used alone; the use of some rating of the quality of the applicant's undergraduate institution seems sufficiently promising to suggest its use in more research studies; and there is need for still further work on the development of satisfactory criteria of success in graduate study.

RESEARCH ON STUDENTS - GENERAL

• Bureau of Social Science Research, Inc. Laure M. Sharp, Study Director

Five Years After the College Degree Part I: Graduate and Professional Education

Bureau of Social Science Research, Inc. Washington, D. C. June, 1965.

This is the first of two monographs reporting the results of a second study of postcollege careers of 1958 college graduates. A cross-section of men and women who obtained academic degrees (B.A.'s and M.A.'s in June) 1958, were first studied in 1960, two years after they had received the degree. The 1960 study was based on a total of 41,497 responses from men and women who had graduated from American colleges and universities. A subsample of these respondents were contacted again in late 1963 and asked for additional information on their education and work careers, covering the period 1960-63.

The body of the work is a series of 49 graphics on a wide spectrum of areas regarding course work, areas of study, duration of study, grants, etc.

Two dominant impressions emerge from the examination of the data presented in this report. One is the tremendous amount of educational activity undertaken beyond the bachelor's degree, in which very large numbers of men and a considerable number of women participate. These activities included much course-taking, much degree enrollment, and a modest amount of degree completion. The second is the unpatterned, helter-skelter way in which much of this education took place. For most students the process was slow, discontinuous, seemingly wasteful. What was most surprising was the finding that for many students this was apparently not an overly disturbing state of affairs. The effect of grants seems marginal on the rate of accomplishment. The ultimate conclusion was the failure of the attempt to superimpose consistent framework on what is essentially a "fairly chaotic and ever-changing situation."

- The Carnegie Commission on Higher Education

  Reform on Campus: Changing Students, Changing Academic Programs

  McGraw-Hill Book Company for The Carnegie Commission on Higher Education. New York. 1972.

  Based on an opinion poll conducted in 1969-70 (the peak years of student unrest) involving 70,000 undergraduates, 30,000 graduate students, and 60,000 faculty members, the findings from the study recommended that colleges and universities should move toward reform, but not for the purpose of hushing campus protest. The changes needed should be undertaken for the sake of students and society to broaden the opportunities for students to find an academic environment and curriculum which improves the quality of their lives.

  The survey showed that students and faculty agreed that good teaching rather than voluminous research should be the primary criterion for faculty promotions; that courses should be more relevant to contemporary life, and, more attention should be paid to the emotional growth of the students. Students and faculty disagreed on two proposed changes: abolishing all grades--59% of the students favored but only 33% of faculty agreed; 51% of the students supported making all courses elective, but only 19% of the faculty agreed.

- Creager, John A.

  The American Graduate Student: A Normative Description

  ACE Research Reports, Volume VI, No. 5. American Council on Education, Washington, D. C. October, 1971.

  This 190-page report is based on data collected in a survey conducted in the spring of 1965 by ACE and The Carnegie Commission on Higher Education. The study, described as the most extensive of its kind, reports findings from the responses of some 33,000 graduate students at 153 institutions to produce normative data for a total population of 980,084 students.

  Some of the highlights of the profile generated include: two-thirds of all graduate students were men, 60% were married and were older than 25 years, and 40% had grades of B+ or better as undergraduates; almost 25% said that their finances were inadequate for their needs and 31% said this lack might or would prevent completion of graduate work; the major sources of income since entering graduate school were listed as teaching and research assistantships (22%), nonacademic jobs (20%), their spouses (17%), and fellowships (14%); the major degree objective was the Ph.D. and 45% expected to earn one, 0.9% of the students already had a doctorate, 30% were in their first year of graduate school, and 8% had been in graduate school 10 years or more; only 2.7% of the graduate students were black and blacks accounted for only 1.9% of those expecting a Ph.D., and 6.3% of those aiming for other doctorates; recreational activities were limited--most watched television for an hour or less each day, and nearly 31% reported they devoted more than 20 hours a

week to studying outside of classroom or laboratory work; nearly 50% rated their institutions highly, but about 25% believed their department's standards for admission and advanced degrees should be higher; and almost 20% would not choose the same field if starting their training again.

A graduate student's attitude toward higher education and society generally depends on his or her field of study: about 75% were satisfied with their education--those in mathematics and physical sciences were the most satisfied and those in the social sciences the least, but nearly 8% were totally unhappy with graduate school; about 60% said that one reason they are in school was to improve their ability to change society but they differed, by field of study, in this purpose and conviction that they could realistically change society.

- Decker, Robert L.

Success and Attrition Characteristics in Graduate Studies

Unpublished paper, Department of Economics, University of California, Berkeley. (Mimeographed.)

Decker made a study of 473 students entering Berkeley from 1956 to 1966 to obtain a Ph.D. in Economics. He tried to determine characteristics of successful candidates by means of comparing these variables: the nature and quality of the undergraduate institution attended, sex, whether a prior M.A. had been earned, and the time elapsed between completion of the B.A. and entry into the Ph.D. program. He reviews the findings and the resulting policy implications. Among other suggestions, Decker proposes, as a remedy for high attrition rates, the expansion of the total graduate enrollment and the simulaneous adoption of a two-track Ph.D. program, with one track for traditional Ph.D.'s and one oriented toward teacher training.

- Gregg, Wayne E.

Graduate Student Satisfaction: Academic and Non-Academic

Paper presented at the 55th Annual Meeting of the American Educational Research Association, Washington, D. C. February, 1971.

The purpose of this study was to discover the extent to which the satisfaction of graduate students is associated with the collegiality of faculty-student relationships within the student's own department, the competitiveness of student-student relationships within the department, and the discrepancy between what the student expected graduate school to be like and the reality of graduate school as he perceives it. Seven hundred and sixty-two graduate students at a midwestern university were administered a questionnaire; 589 unusable responses were returned. On the basis of a pilot study and item analyses, Likert scales were constructed for the measurement of the major variables of this inquiry. Each item was scored on a five-point scale, the high score indicating a high level of satisfaction. The findings indicated that the collegiality of faculty-student

relationships is a highly effective predictor of both academic and non-academic satisfaction for all categories of students, whether grouped by sex, department size, school within the university, or degree objective. Competitiveness of student-student relationships is a consistently negative predictor of both types of satisfaction. Expectation-reality discrepancy is also negatively associated with both types of satisfaction.

- Harvey, James

The Student in Graduate School

American Association for Higher Education. Washington, D. C. January, 1972.

Much of the published literature on graduate education is in the mode of criticism, and considerable criticism centers on the position of the graduate student. This report assesses the major criticisms in light of the research findings. Major findings show that: graduate students are concentrated in prestigious universities and most graduate students receive their undergraduate training at universities rather than colleges; special groups, such as teaching assistants, part-time students, and women, generally have unique problems that are essentially ignored; students are disturbed by many of the components of graduate education, specifically language examination requirements; general requirements are a source of complaint; the dissertation and research phases of doctoral study are seemingly lacking in the proper guidance needed for a student to conduct his own research in his own fashion without being threatened; doctoral study is excessively long; students in the sciences seem more pleased with their programs than those in the arts or social sciences because more adequate funding is available for science programs; and although graduate students are not nearly as destitute as many imagine, financial aid should be more equally distributed among the disciplines.

It is concluded that the chances of accomplishing the changes desired by students, without diluting the quality of graduate education, are not encouraging; but student desires, coupled with other forces, may require modification of programs if they are to remain viable and attractive.

- Hiestand, Dale L.

Changing Careers after Thirty-Five: New Horizons Through Professional and Graduate Study

Columbia University Press. New York. 1971.

The author deals primarily with people who make a change in career orientation so distinct that the move requires at least a year of professional or graduate education. Chapters examine such topics as the changing nature of middle age; fields of study or endeavor (mainly social work, librarianship, elementary and secondary education, and other service professions) favored by middle-aged students; reasons why men and women over 35 decide to enter or reenter professional or graduate school; and kinds

of financial, academic, and family problems and adjustments experienced by such students. Seventeen case histories are presented to illustrate a wide diversity of motives, circumstances, and personal characteristics. Major findings include the following: most middle-aged people who change careers were largely successful and satisfied in their previous work; they tend to be dynamic individuals actively searching for new interests; many people who return to work act with relatively little prior planning or guidance. Implications for education and guidance, theories of occupational choice, developmental psychology, and manpower policy formation are discussed in the last chapter. An index and seven tables are included.

- Melnick, Murray

Counseling of Doctoral Candidates

Abstracts and Reviews of Research in Higher Education, No. 13. Center for the Study of Higher Education, Hofstra University. Hempstead, New York. June, 1971.

This report abstracts 13 studies directly or indirectly concerned with the counseling of graduate students. They identify some of the problems graduate students face and suggest changes that could be made in graduate programs to alleviate student dissatisfaction. The studies deal with: the need for counseling, the stifling of creativity, foreign language requirements, faculty-student contacts, predictions of postgraduate success, time taken to complete the Ph.D., and dropouts.

- Scheader, Catherine

The Publishing Behavior of Graduate Students in Reading

Unpublished Master of Education thesis, Graduate School of Education, Rutgers University, June, 1971.

A questionnaire was sent to 166 graduate students from the Reading Center files in the Graduate School of Education at Rutgers University during the years 1965-70; 95% responded. Publication was reported by 19% of the respondents. Another 38% wrote unpublished curriculum materials that were reproduced and distributed in their school systems. Analysis indicated that college teachers published more than any other group of teachers, teachers published more than nonteachers, doctoral students published more than master's students, those who elected a course in developing materials for publication published more than those who did not, and students who published their work used reading factors more frequently than those who wrote unpublished curriculum materials. Literature in the wide area of higher education and the more narrow areas of educational research psychology, sociology, and science was reviewed to deal with publishing behavior in these allied fields. Tables and a bibliography are included.

TYPES OF STUDENTS AND PROBLEMS
(Disadvantaged, Minority, Foreign)

- Astin, Helen S., et al.

  Higher Education and the Disadvantaged Student

  Human Service Press. Washington, D. C. 1972.

  This comprehensive study, begun in the spring of 1969, was conducted by the University Research Corporation in cooperation with the American Council on Education. Part of the data was collected from 19 case-study institutions by a team of consultants familiar with special programs and education of the disadvantaged; other information came from ACE's extensive collection of longitudinal student and institutional data. The report is developed in seven chapters. Chapter one outlines the basic problem and the design of the study, and the following chapters in turn: review some of the literature of the disadvantaged, discuss certain aspects of the learning process as related to the disadvantaged, and describe the components of various types of compensatory education programs; present the findings from the 19 case studies, summarize and evaluate their strengths and weaknesses, and look to the future of such programs; give the results of the survey data with special emphasis on the educational progress of students in special programs and how the various college environments affect student growth; examine the eductional and personal outcomes of economically and educationally disadvantaged students in college; present the summary and conclusions reached; and offer a number of guidelines for program development and evaluation. A selected bibliography and appendices pertinent to the study are included. The limitations of the study and the heterogeneity and diversity of present programs and their results suggest the need for further research and planning.

- Harari, Maurice

  Priorities for Research and Action in the Graduate Foreign Student Field

  International Educational Cultural Exchange, Volume VI, No. 2, 60-67, Fall, 1970.

  This paper was presented at the Colloquim on the Graduate Foreign Students, Racine, Wisconsin, June 1970, and decries that graduate foreign student programs lack the collaboration, consultation, and problem-solving efforts of U. S. government agencies, foundations, and universities.

- Harvey, James

  Minorities and Advanced Degrees

  Research Currents (ERIC Clearinghouse of Higher Education, The George Washington University). American Association for Higher Education. Washington, D. C. June 1, 1972.

  This paper examines some of the literature that deals with efforts to

increase the numbers of minority students enrolling in post-baccalaureate medical, legal, and graduate programs. The problem of increasing minority representation in research, teaching, and the professions is serious. In spite of some impressive gains, it remains that when the array of special programs for minority groups is analyzed, the result shows that most graduate and professional schools have a long way to go. Law schools demonstrate the best record of minority enrollments, with percentages ranging from 2% or less to 16%. The graduate schools of arts and sciences and the medical schools indicated a minority enrollment of under 5%. To increase these percentages it is necessary to increase the availability of special grant programs, as minority students cannot be expected to undertake further loans when often they have borrowed heavily for their undergraduate education. Funding is only a temporary measure and the long-term solution lies in improving the educational opportunities available to minority students at all levels--from preschool to undergraduate. The real answer lies not with remedial summer programs, but in improving the teaching and facilities available to these students so that they can compete on an equal basis.

The literature reports that only 294 or 0.8% of the 37,456 doctorates awarded between 1964 and 1968 were awarded to black Americans and half the doctorates received were in the field of education. Ph.D. programs have not attracted black students either because of the length of time required, financial problems, or racism. It is pointed out that the aspirations of black students for a post-baccalaureate degree, the M.A., are higher but more nonblack students aspired to professional degrees--with the blacks' aspirations declining in college while those of the white students increased.

- Howard, Bill

Blacks and Professional Schools

Change, Volume 4, No. 1, 13-16, February, 1972.

The author notes that black students are encountering difficulty in gaining admission to both white graduate schools and the predominantly black graduate and professional schools. The dwindling of federal and private support that has affected graduate education generally is cited as a major cause; but at those schools where a strong commitment has been made, funds have been found.

Most of the author's analysis is based on data from the Office of Education and the Bureau of Labor Statistics, but he refers to the Carnegie Commission Study of Black Higher Education, Between Two Worlds, and cites other studies conducted on black students in medicine and law. The difficulties encountered by blacks in white graduate schools led, according to Howard, to the formation of the ad hoc National Alliance for Graduate and Professional Training for Black People.

- Mack, Grace E.

  The Black Woman Graduate Student

  Women on Campus: Proceedings of the Symposium. Center for Continuing Education of Women, The University of Michigan. An Arbor. 43-45. October 14, 1970.

  Grace Mack emphasizes that the experiences of black students on a university campus evolve primarily from situations that affect them because of their race rather than their sex. She postulates that blacks have a major contribution to make to the university in that they will not accept education as it is presently constituted and are committed to bringing about change.

- Parry, Mary Ellen

  A Survey of Programs for Disadvantaged Students in Graduate Schools

  PR-70-1. A cooperative survey by the Council of Graduate Schools in the United States and the Graduate Record Examinations Board. Educational Testing Service. Princeton, New Jersey. February, 1970.

  Findings were obtained by means of a survey sent to the 287 members of CGS; usuable replies were received from 248, of which 150 supplied information about programs and procedures for disadvantaged students. The major findings of the study were: methods of recruitment vary widely in type and scope--from personal contacts to sending promotional literature, and from a national effort for a few to a state or regional effort for most; many graduate schools waive or liberalize the admission requirements of previous scholastic records and test scores, but letters of recommendation are emphasized; special remedial services are offered at many graduate schools such as tutoring, counseling and advising, and makeup of undergraduate courses needed; university funds are the most common source of support, and total tuition remission is the most frequently provided financial aid, although other types are given and the dollar value ranges up to $5,000/student; most of the special procedures and programs that exist were established in 1967 or later, and few changes have been made or planned, while most already made involve more money, greater recruitment, and some expansion of program; most graduate schools report 10 or fewer disadvantaged graduate students enrolled, but the numbers have increased substantially in recent years; and most graduate schools feel that it is too early to evaluate the effectiveness of their special programs or procedures because of their newness, while others report success.

- Sasnett, Martena T. and Inez H. Sepmyer

  Graduate Study in the United States: A Guide for Foreign Students

  Institute of International Education, New York. 1972.

  This 24-page booklet, prepared by IIE in cooperation with CGS and AGS,

outlines the methods and requirements of U. S. graduate study; discusses costs, required admission tests, and government regulations; and it lists many conseling offices overseas and contains a bibliography of sources of more detailed information. This guide is recommended for the prospective foreign student--currently nearly half of the 145,000 foreign students reported in U. S. colleges and universities are graduate students.

- Task Force on Crucial Issues of NAFSA

  An Inquiry into Departmental Policies and Practices in Relation to the Graduate Education of Foreign Students

  National Association for Foreign Student Affairs. Washington, D. C. 1972.

  Studies of departmental policies and procedures in relation to foreign students were made at twelve universities (two departments were surveyed at each university) during the winter of 1971. The 24 reports or case studies (representing the disciplines of chemistry, electrical engineering, civil engineering, business administration, economics, and educational administration) provided the basis of the publication which consists of an introduction, summary findings, general conclusions, appropriate commentary by the Task Force, a postscript, and appendices.

  The data collected clearly indicate that, for the most part, the policy and procedures of most institutions and departments as they relate to the foreign graduate student leave much to be desired. In most cases the basic issues have either not been faced or translated into practical application when admitting foreign graduate students and providing services for them. It is recommended that the entire matter of the foreign graduate student needs further attention and research if the continued education of growing number of foreign students in the U. S. is to have the positive results for which all hope and strive to achieve.

- United States Commission on Civil Rights, by Eli Ginzberg and Dale L. Hiestand

  Mobility in the Negro Community: Guidelines for Research on Social and Economic Progress

  Clearinghouse Publication No. 11. U. S. Government Printing Office. Washington, D. C. 1968.

  A research program, designed to measure and evaluate the social and economic mobility of the American Negro, is described. The historical factors controlling social and economic movement are discussed, as are the current status and the emerging of the Negro middle class, the widening gap between lower and middle class Negroes, the role of education in mobility (more than half of all Negroes in college are in segregated colleges in the South), and the general improvement of status. Much remains to be done and the improvement of data collection is needed if further qualitative and quantitative progress can be achieved.

- U. S. Department of State. Agency for International Development. Office of International Training. Academic Advisory Staff.

  A Bibliography of Reference Materials for Evaluating Foreign Student Credentials

  AID, U. S. Department of State, Washington, D. C., 1972.

  This bibliography is the result of several years of systematic building and improving the reference library for the Academic Advisory Staff of the Office of International Training, AID, Washington, D. C. AAS analyzes and interprets the academic credentials of AID participants (foreign students) from cooperating countries in terms of the educational system of the U. S. To carry out this service, AAS has developed an outstanding library of reference materials for use by credentials analysts, educators, and AID staff members. This library has had the continuing input of resource suggestions from AACRAO professional credential analysts, fifty of whom during the past seven years have spent periods of two weeks each in the Office analyzing AID participants' dossiers and filling out the "Credential Analyst Worksheets" which are used as guides in the placement and admission of the participants in U. S. universities and colleges. Since about half of the foreign students enrolled in the U. S. institutions are graduate students, the Bibliography is recommended as an excellent reference source for graduate schools.

W O M E N A S R E L A T E D T O

H I G H E R E D U C A T I O N

WOMEN AS FACULTY MEMBERS

- Astin, Helen S.

  Employment and Career Status of Women Psychologists

  American Psychologist, Volume XXVII, No. 5, 371-381, May, 1972.

  This investigation of the career status of academic psychologists documents the relatively low status of academic women in psychology in comparison to their male colleagues. Although lower rank, lower salary, and lack of tenure are a consequence of merit considerations (degree held, publications, etc.), these analyses suggest strongly that such is not the case. Even when women hold doctorates, or receive their degrees from top-ranked departments, or publish as much as men, they still are paid lower salaries than the men and receive less recognition in the form of high rank and tenure.

  Among new Ph.D.'s, women have always had a somewhat harder time locating employment than have the men, and these sex differences have been increasing in the recently tightening job market. Compared to sex differences in academic rank, salary, and tenure, the relative difficulty that the new Ph.D. finds in securing initial employment appears to be minor.

- Fields, Cheryl M.

  Women's Rank, Pay, and Tenure Status Found Behind Similarly Qualified Men's

  The Chronicle of Higher Education, Volume VI, No. 32, 1, 3, May 15, 1972.

  This is a report of The Astin-Bayer Study which was based on data drawn from the national survey conducted in the spring of 1969 by The Carnegie Commission in cooperation with ACE. Resonses were obtained from 60,000 faculty members at 300 colleges and universities, and in general the results tend to confirm in statistical terms that women with similar academic credentials often are not recruited, promoted, or paid at rates equal to men. Of the men surveyed, 25% were full professors and 49% held tenure compared to 9% female full professors and 39% of the women holding tenure. The report points out that fewer women than men in academia have doctorates, spend time in administration, have strong research interests, publish in a professional journal, or are highly mobile. But a significantly higher percentage of the women than the men teach undergraduates only and a higher percentage of the women teach nine hours or more per week.

- Harvard University. Caroline W. Bynum and Michael L. Walzer, Committee Co-chairmen

  Report of the Committee on the Status of Women in the Faculty of Arts and Sciences

  Harvard University. Cambridge, Massachusetts. April, 1971.

  The report finds that the number of women on the Harvard Faculty of Arts and Sciences is very small. In contrast to undergraduate women, who are not officially recognized as Harvard students, graduate women are present in sizeable numbers and are equal members of the Harvard community. The problem for faculty women and for women graduate students is in some sense the same problem. It is, according to the report, "a simple and obvious problem: women are not hired in significant numbers by high-status institutions." There are virtually no women on the Harvard faculty, and female graduate students anticipate and encounter difficulties in job placement. The solution, they feel, is equally simple: hire more women; but in order for this to happen, existing prejudice against women as scholars and colleagues must cease to stand in the way of hiring, and new career patterns must be permitted for women who desire to combine careers and families.

  A group of twenty-four specific proposals forms the concluding section; these proposals range from establishment of committees in which would conduct periodic reviews of tenure and maternity leave to gynecologists and day care services. Implementation of these proposals, as the Committee itself acknowledges, would make Harvard a coeducational institution.

- Lewin, Arie Y., and Linda Duchan

  Women in Academia

  Science, Volume CLXXIII, No. 4000, 892-895, September 3, 1971.

  The authors review the literature and the controversy a significant part of which involves the alleged bias against women in academia, the role of women, and discrimination against women in society and report a study of the hiring decisions in departments of one physical science (unspecified). They report that women are discriminated against in: the salary differential between them and men; in the awarding of research grants; in lack of job opportunities; fewer advancements; and in social and psychological ways, especially in science.

  The study involved the responses of 111 (62%) chairmen of all graduate departments of a physical science discipline out of the total of 179 contacted. The results of the survey were classified according to certain parameters and analyzed statistically. Although most of the individual tests did not yield statistically significant differences, the authors conclude that the data consistently yielded a trend in the direction of the existence of discrimination against women in academia. Further, they state that this leads to the tentative conclusion that: when two equally qualified applicants are being considered for an academic position, a male will be

chosen over a female; however, a woman with clearly superior qualifications, in competition with an average man, is likely to be recognized; and the bias seems to hold, especially for high-quality schools, in departments with younger and newer chairmen, and for chairmen from schools located in the eastern and western parts of the U. S.

The authors recommend that institutions initiate internal changes to ameliorate bias against women before this is mandated by federal enforcing agencies and that federal grant-awarding agencies such as NSF and NIH be given a mandate to make a special effort to identify and award grants and other forms of recognition to deserving women scientists.

- Michigan State University. Office of Institutional Research

A Compilation of Data on Faculty Women and Women Enrolled at Michigan State University

Michigan State University. East Lansing. July, 1970.

Most of this report consists of tabular data covering the following items: the total instructional staff, the faculty under tenure rules, the temporary instructional staff, salaries, new faculty, the rate of promotion of faculty women, length of service to Michigan State University, women in administrative positions, women graduate students, total enrollments of women at Michigan State University, changes in the number of women faculty since 1962, promotion recommendations, and other staff. The data are summarized in two pages. Findings include the fact that a greater percentage of men than women are under tenure rules; men's salaries are generally higher; the scarcity of women in some fields does not always reflect a scarcity of women with doctorate degrees; a greater percentage of women applicants were accepted to graduate study than men, yet a smaller percentage of women than of men received financial aid; and while women students have increased significantly among enrollees and degrees earned in a nine-year period, the number of women faculty under tenure rules remained the same.

- Robinson, Lora H.

The Status of Academic Women

Review 5. ERIC Clearinghouse on Higher Education, The George Washington University. Washington, D. C. April, 1971.

This report is concerned with identifying both the activities and the references aimed at defining the current status of academic women. It is divided into three sections: an essay which reviews some of the more important literature in the field; a series of annotated campus reports; and a directory of beginning or continuing projects focused primarily on women in higher education. Following the directory of projects is a list of references. Except for three instances, reference sources cited in the section on campus reports do not appear again in this final bibliography.

• Rossi, Alice S.

Status of Women in Graduate Departments of Sociology, 1968-1969

The American Sociologist, Volume V, No. 1, 1-12, February, 1970.

This paper reports the results of a survey undertaken in the spring of 1969 on the status of women as students, faculty, and research personnel in graduate departments of sociology during the academic year 1968-69. The statistics reflect a very negative situation in the role of women in the flow from undergraduate sociology majors through to the chairmanship of a graduate department; e.g., although 43% of the college seniors planning graduate work in sociology are women and 30% of these become Ph.D. candidates in sociology, only 4% progress to the status of full-time professors, and a bare 1% become chairmen of graduate sociology departments. It is suggested that the sociology departments themselves should apply their skills to devise institutional arrangements that would permit more women to persist and advance up the academic hierarchy.

WOMEN AS STUDENTS

• Ad Hoc Committee of The Coordinating Committee on Graduate Affairs. H. W. Magoun, Chairman

Women in the Graduate Academic Sector of the University of California

University of California. June, 1972. (Mimeographed.)

The study establishes a need for more extensive data, and states that, at best, the data collected in this study will only allow the questioning and refutation of general presumptions about women in graduate education. Five first-stage positive steps toward the improvement of women's opportunities in graduate education are enumerated. The study presents data, by sex, from all U. S. institutions, on graduate enrollment, bachelor's, master's and doctoral degrees awarded. Similar data are presented for the University of California system, along with additional data on women graduate applications and admissions, fellowship support for women and representation of women in the faculty. And comparable data are presented also from the individual campuses at Berkeley, Davis, Riverside, San Francisco, and UCLA, with additional data from UCLA on minority-group women, C. Phil. degrees awarded, and women in doctoral candidacy. These data are presented in 38 pages of tables and 19 pages of text.

- Astin, Helen S., and Thema Myint

  Career Development of Young Women during the Post-High School Years

  Journal of Counseling Psychology Monograph, Volume XVIII, No. 4, 369-393, July, 1971.

  The study reported here utilized longitudinal data collected by and maintained in the data bank of Project TALENT. The sample consisted of high school senior girls who were surveyed in 1960 and followed up in 1965. The study was designed to explore the career development of women during the five-year period after high school. The primary interest was in isolating predictor variables--in this case, personal characteristics as high school seniors and experiences during the period that followed--of career outcomes five years after high school. The study addressed itself to three specific questions: what are the personal characteristics of twelfth-grade girls that predict their vocational choices five years after high school; what are the educational and other experiences since high school that affect women's career plans during these years; what are the personal and intellectual traits of women who persist in a career as opposed to those who change their plans.

  The study found that girls who in high school score high on scholastic aptitudes, especially on mathematical ability, and who plan to pursue higher education and aspire to an advanced degree usually choose fields that require greater career commitment--the natural and social sciences, the professions, and teaching. Plans to do office work or to be a housewife usually are made by girls with less aptitude and fewer academic interests. If these girls get married, they will more likely plan to be housewives, but if they remain single, they tend to pursue office work. Girls who have an interest in social service and the health fields but little interest in pursuing advanced education usually continue to choose those careers. Full-time employment after high school graduation, an early interest in business and management, a B.A. degree, and unmarried status proved to be the best predictors of plans to pursue a business career.

- Fox, Greer Litton

  The Woman Graduate Student in Sociology

  Women on Campus: Proceedings of the Symposium. Center for Continuing Education of Women, The University of Michigan. Ann Arbor. 32-35. October 14, 1970.

  In a study of 25 women graduate students, the author finds four factors relating to academic considerations in students' decisions to continue in graduate school or drop out. They are performance, interest level, and relations with male graduate students and with faculty members. The author discusses several of the negative aspects with regard to these relationships, and suggests some possibilities for improving faculty attitudes.

• Kramer, Noel Anketell

Discrimination and the Woman Law Student

Women on Campus: Proceedings of the Symposium. Center for Continuing Education of Women, The University of Michigan. Ann Arbor. 39-41.

The author reviews common experiences of discrimination against women entering law school and seeking employment in law firms after graduation.

• Pifer, Alan

Women in Higher Education

Speech given before the Southern Association of Colleges and Schools, Miami, Florida, November 29, 1971.

Pifer discusses the decline in participation by women in higher education, the cultural and psychological factors inhibiting women, the barriers to the advancement of women, women's colleges, and coercive government action for the protection of women's rights. He suggests noncoercive measures to promote the fuller participation of women in all aspects of higher education.

• Sells, Lucy W.

Disciplinary and Sex Differences in Doctoral Completion

Unpublished research paper. Department of Sociology, University of California. Berkeley. 1972. (Mimeographed.)

In the course of her doctoral research the author has compiled comparative data on doctoral production in various academic disciplines. The information is presented in the form of tables which show: the proportion of bachelor's, master's, and doctorates earned by women at Berkeley during two five-year time periods--1948-1953 and 1963-1968; the attrition of students in post-master's programs; and a study of Woodrow Wilson Fellows with respect to disciplinary and sex differences in dropout rates--including the effects of sex, field, parenthood, and second and third year financial support on the dropout rate. Further tables show the percent of doctorates earned by women at the five top departments in selected disciplines for the two time periods and the last table shows the distribution of women doctorates across the top five departments in selected fields.

- Stokes, Sybil L.

  Women Graduate Students in Political Science

  Women on Campus: Proceedings of the Symposium. Center for Continuing Education of Women, The University of Michigan. Ann Arbor. 36-38. October 14, 1970.

  Sybil Stokes discusses the problem of the very small number of women earning Ph.D.'s, and cites a study indicating that this number is not due to attrition rates but to the small number of women who begin a Ph.D. program. She points out hopeful indications of moves toward greater parity among men and women in academia and in the professional disciplines.

- Woodrow Wilson Foundation

  Ms. Fellow

  Woodrow Wilson Fellowship Newsletter. No. 25. Woodrow Wilson Foundation. Princeton, New Jersey. March, 1972.

  National data on female fellows are reviewed and compared to male recipients. The Washington Chapter of WEAL has reported a survey showing that few women receive prestigious graduate fellowships and cites the White House and Fulbright Fellowships as examples where women have received less than 10% of the available awards. In 1960 women received 11% of the doctorates awarded in the U. S. and by 1970 this percentage had risen to only 13%.

  Comparatively, the Woodrow Wilson programs show a better track record. Over the past 15 years about 40% of the candidates nominated have been women and 30% of the elected fellows have been female. During 1967-70 when the Foundation conducted its Designation Program, the results show that women were 1.5 times as likely as men to need support from the Foundation. In the Dissertation Fellowship Program 23.4% of the eligible candidates were women and 26.3% of the awards were made to them. Follow-up of the female fellows in the classes of 1958, 1959 and 1960 (800 women), with 69% responding, indicated that: 47% had the Ph.D. compared with 76% of the men in the same years; another 5% of the women are still active Ph.D. candidates; 40% had Master's degrees; 58% were teaching; 18% were either housewives or unemployed; and the remainder are in nonacademic employment. The median length of time taken by women fellows to achieve the Ph.D. was seven years, well below the national average. Women who held Dissertation Year Fellowships have a better record of completion than the cohort of first-year fellows; by 1971, 69% of the women holding these fellowships between 1962 and 1967 had Ph.D.'s compared with 88% of the men.

WOMEN AS UNTAPPED RESOURCE

- Arter, Margaret Helen

The Role of Women in Administration in State Universities and Land-Grant Colleges

University Microfilms, Inc. Ann Arbor, Michigan. 1972.

The purpose of this study was to investigate the role of women in the administration of institutions of higher learning, more specifically, in institutions in the Association of State Universities and Land-Grant Colleges. Findings and conclusions were based on data derived from two questionnaires sent to presidents or chief officers of multi-campus institutions and to women in top-level administration posts in the 118 member institutions. The findings showed that: the ratio of male to female faculty members was five to one; over one half of the institutions did not have women in top-level administrative positions and seventeen states had none; sixty percent did not have women who met the criteria of the study; one half did not appoint women to administrative posts in the last five years and one third had not considered women in that period; but ninty-three percent on the institutions stated that they would consider qualified women of top-level posts. Information obtained from the sample of women administrators was used to determine the relationship between position, academic rank, and salary and personal background, educational background, professional experience, duties and responsibilities, and attitudes on employment status.

- Houser, Carolyn

A Graduate Student in Population Planning Looks at the Future for Women

Women on Campus: Proceedings of the Symposium. Center for Continuing Education of Women, The University of Michigan. An Arbor. 46-48. October 14, 1970.

Carolyn Houser feels that we cannot continue to raise women who seek their primary personal fulfillment through the experiences of motherhood, but who are equipped to find satisfaction in other sources of fulfillment. She suggests that a new kind of partnership between men and women can serve as a model for the solution to a basic problem in human relationships: how do people (or nations) that consider themselves equal, different, and sovereign, relate in a productive and reciprocal way without falling into patterns of coercion, paternalism, dominance, or submission?

• Sells, Lucy

Current Research on Sex Roles

Research Committee, Sociologists for Women in Society, University of California. Berkeley. August, 1971. (Mimeographed.)

This bibliography lists eight action organizations, four pages of bibliographies and lists, and 37 pages of sources of studies on women with regard to the following subjects: academic status, economy, polity, family (with subheadings such as intra-family interaction, abortion, sexuality), demography, minority women, religion, the feminist movement, sex roles, culture, and courses.

WOMEN--GENERAL

• Astin, Helen, et al.

Women: A Bibliography on Their Education and Careers

Human Service Press. Washington, D. C. 1971.

This bibliography, listing 352 sources, features a ten-page overview of the findings by Astin and fifteen pages of interpretation and implications for the future, as perceived by Nancy Suniewick, one of the other authors. The sources are categorized in seven major classifications, as follows: determinants of career choice, marital and familial status of working women, women in the world of work, developmental studies, history and economics of women at work, commentaries and policy papers, and continuing education of women. The bibliography also provides subject and author indices.

• Heyns, Roger W., et al.

Sex Discrimination and Contract Compliance

A.C.E. Special Report, American Council on Education, Washington, D. C., April 20, 1972.

Roger Heyns provides an introductory statement to the report, entitled "Beyond the Legal Requirements," offering several proposals that can be implemented by universities to improve women's status. Two documents form the body of this report; the first, by Betty Pryor, "Laws and Regulations on Sex Discrimination," summarizes the Presidential orders, the law, and pending legislation with respect to sex discrimination in higher education. The second, "HEW Contract Compliance--Major Concerns of Institutions," by Bernice Sandler and Sheldon Elliott Steinbach, describes a typical compliance review and deals with issues that have arisen as institutions have sought to comply with the legal requirements and to prepare affirmative action plans for the employment of women.

RECOMMENDATIONS FOR THE FUTURE

PROGRAMS, CURRICULA, AND DEGREES -- REFORMS AND CHANGES

- American Political Science Association. Committee for an Exploratory Study of Graduate Education in Political Science.

  Obstacles to Graduate Education in Political Science

  P.S., Newsletter of the American Political Science Association, Volume II, No. 4, 622-641, Fall, 1969.

  During the 1968 American Political Science Association Convention, a group of graduate students from several different universities formed the National Committee on Graduate Education in Political Science. As a result of that effort, the APSA established the Committee for an Exploratory Study of Graduate Education in Political Science.

  The Committee's work was divided into four major efforts: interpretive essays; department surveys (institutional data); sample survey of graduate student members of the Association; and general information gathered from reports, visits, and general communications.

  The Committee made two groups of recommendations. The first were directed toward the Association: that graduate students be given greater professional responsibilities; that a permanent Committee on Graduate Education be established to disseminate literature and to study specific areas of importance; and that statistical data on the graduate school departments be published. The second group of recommendations were directed toward the departments: that students be included in department decision-making; that there should be greater preparation of students for teaching and greater attention to teaching by the faculty; that data be collected to maintain viable programs; that consideration be given to innovative programs; and that a curricula should include formally organized offerings of political and social inquiry.

  Appended to the article are the statistical results of the Committee's inquiry.

- Booth, David

  Institutionalizing Innovation in Graduate Education

  Graduate Comment (Wayne State University), Volume IX, No. 3, 159-165, 1966.

  This paper focuses on the idea that the time is right for the social scientists to look for new approaches to graduate education and related evaluative research. The author suggests a "Center for Research and Development in the Education of Social Scientists," to be composed of academicians, government officials, and foundation members. Beyond this he recommends:

"career reality testing" for students to supercede existing recruitment and training; work-study programs; and changes in curriculum, particularly those that would give students a greater role in decision-making.

- The Carnegie Commission on Higher Education

The Fourth Revolution: Instructional Technology in Higher Education

McGraw-Hill Book Company for The Carnegie Commission on Higher Education. New York. 1972.

As one of the several recent reports of the Carnegie Commission on Higher Education, this publication urges strong efforts to develop educational technology for use in higher education and asserts that appropriate use of technology has great potential for extending and strengthening education by releasing faculty time and expanding higher education to "millions of Americans who have not been able to take advantage of it in the past." Specifically, the Commission predicts and advocates vast increases in college instruction by cable TV, videotape cassettes, computers, and other electronic devices. By the year 2000, the Commission estimates up to 20% of on-campus instruction may be conducted by "informational technology," and as much as 80% of off-campus colleges-without-walls instruction may depend on the new technology. The report also warns against too great expectations too soon because schools are wary of introducing untested technology, costs are high, and at present there is an inadequate supply of good instructional materials that can be used for this purpose. The Commission recommends the establishment of seven regional "learning technology centers" to develop materials and to allow institutions to share them conveniently.

- Crawford, Bryce, Jr.

Report by the President: The Reasons Why

Journal of the Proceedings and Addresses of the Twenty-Second Annual Conference. Association of Graduate Schools in the Association of American Universities. Montreal, Quebec, Canada. 5. October 22-23, 1970.

In his retiring report, Crawford observes that graduate education is being pressed to change: there are services society needs and for which it looks to graduate education, but which we are not providing. Some things need not changing, but guarding: selective admission, the emphasis on research, and the importance of publication are examples. We need to retain a selective admission policy to avoid the effective dilution of graduate-level instruction, and we do students who do not have the ability for graduate study a disfavor if we admit them. Emphasis upon research and publication is justified because it keeps the faculty member at the forefront of his field, which gives depth and richness to his teaching and envlivens it. Publication is a device through which scholarship keeps itself pure and healthy by exposing it to the criticism of peers. We need to be responsive to the real needs for the development of new programs and degrees, but we must not cheapen or discard

the Ph.D., which has served society well and will continue to do so as long as we maintain it as a degree with the significance and quality it has traditionally had.

- Gorter, Wytze

Some Thoughts on Graduate Education in the Year 2000

Graduate Education Today and Tomorrow. Leonard J. Kent and George P. Springer, editors. University of New Mexico Press. Albuquerque. 52-55. 1972.

Dean Gorter points out that much of what is learned today will become obsolete at an ever-quickening pace and anyone holding a graduate degree will need, periodically, to return to the university for short intensive programs of instruction. He suggests that to insure proper exposure to the latest developments in any field, degrees might be given for a specified period of time with recertification contingent upon further study at intervals. He advocates the shortening of the undergraduate years to allow graduate study to be undertaken sooner. The age range of the student body would widen and give the degree-seeking students contact with experienced practitioners who have returned to the campus.

- Heiss, Ann M.

Graduate Education in a Society in Transition: A Working Paper

Unpublished paper prepared for a meeting of the National Board on Graduate Education, Washington, D. C., March 29, 1972. (Mimeographed.)

Prepared as a "working document" for the NBGE, Heiss reviews and synthesizes the literature published and the recommendations proposed on graduate education within the last five years in this comprehensive paper. She approaches the task by delineating the various categories of concerns around which research findings and recommendations have been made by focusing them in the form of seventeen major propositions, which are analyzed and discussed. A digest of recommendations made by various assemblies, boards, commissions, and councils, including the Assembly on University Goals and Governance, The Carnegie Commission on Higher Education, the National Science Board, and the Council of Graduate Schools in the United States, is included. A comprehensive, but selective, bibliography is provided.

- Mayhew, Lewis B.

Jottings

Change, Volume IX, No. 1, 54-55, February, 1972.

The need to undertake serious reform of our graduate schools and the forces the author believes will motivate graduate faculties to change are

emphasized. Questions regarding degree structures and programs as related to the changes purported as needed are reviewed and discussed. Mayhew believes that the directions reforms are likely to take center about: interdisciplinary graduate programs; increased significance of mathematics, statistics, and computer science in all fields; modification of admissions standards and performance requirements for minority-groups members; the place and survival of ethnic studies programs; the preparation for college teaching via the D.A. route or within the Ph.D. framework; administrative reorganization to allow for new approaches; and the number of graduate programs adequate to the nation's needs.

Mayhew, Lewis B.

- Reform in Graduate Education

SREB Research Monograph No. 18. Southern Regional Education Board, Atlanta, Georgia. 1972.

This timely monograph is concerned with changes, innovations, and reforms in graduate education in the arts and sciences. The book was written as an aid to faculty and administrators who must plan graduate programs in the future. While it does make suggestions and recommendations, it is chiefly intended to raise questions and to suggest ways by which graduate curricula may be examined and changed. The author reviews the development of graduate education and gives a summary of the changes currently demanded in the literature. In the next chapters the author discusses curriculum and instruction; structure and organization, as departmental structure and degree structure; the preparation of college teachers--suggesting the need for a dean of instruction in a department and a look at admissions criteria; old and new issues--changing purposes, research, custodial function, and several unresolved issues -- foreign languages, examinations and theses, and supply and demand. He feels that the developmental needs of graduate students are neglected. Case studies of various institutions are given. The last chapter deals with guidelines for change and discusses such topics as a system of alternative tracks, curriculum elements, degree programs, examinations, admissions processes, departmentalism, dissertations, and other pertinent points.

- Stanford University. J. Merrill Carlsmith, Study Director

The Study of Graduate Education at Stanford

Stanford University. Stanford, California. June, 1972.

This volume constitutes a very comprehensive and pertinent study made to identify and articulate long-range goals of graduate education, particularly that toward the Ph.D. degree, in Stanford University. Departmental visitation teams made reports and this study includes their recommendations. The focus of these recommendations is concerned with the Ph.D. programs in the humanities and sciences, and to a lesser extent in engineering and other Ph.D. programs elsewhere in the university. It is intended that the

recommendations be applied to Ph.D. programs only as applicable and not necessarily to all 55 Ph.D. programs at Stanford. Each section defines the problems and gives alternative solutions. The topics included are assumptions and goals; autonomy, accountability, and the department; the four-year Ph.D.; the assessment and reporting of students' performance and prospects; the Ph.D. dissertation; graduate student teaching; financial aid; and alternative degree programs. Special topic reports were made on: minority students; role of the library in graduate education; foreign students; women students, faculty, and employment; postdoctoral fellows; and graduate student participation in decision-making. A report is given on periodic departmental visitation. A very good summary of the recommendations and their implementation is given for each of the areas covered in the report. Extensive reports and background statistics and tables are given in appendices.

- Tilly, Charles

Reflections on the Future of Universities and of University Women

Women on Campus: Proceedings of the Symposium. Center for Continuing Education of Women, The University of Michigan. Ann Arbor. 50-55. October 14, 1970.

Tilly identifies conflicting activities within universities (multiversities) today and suggests reshaping the idea of a university to that of the creation of four different organizations in the same general location, each carrying its appropriate activity. They would be a science center, devoted to research; an action center, where systematic knowledge would be applied to practical social problems; a critical university, open to all and teaching a whole range of topics; and a technical university, preparing professionals, with an emphasis on field work early in the program. He proposes that the general knowledge taught in the first two years of college be compressed into an education acquired by all, ending at age 16, then a break in formal schooling for two years or more. This system would make it possible for people of all ages and backgrounds to learn together, reducing discrimination toward women especially, and toward those who take time out to work or travel. He admits that his plan would meet with much opposition and then details what developments he feels will most probably occur in higher education.

- Weisinger, Herbert

What Can the Two-Year College Do for the University?

Paper read at Modern Languages Association Meeting, December, 1971. (Mimeographed.)

Weisinger concludes that the future of graduate education is in serious jeopardy and the implications to students, faculty, employers, and society at large are grave. He postulates that solutions should be predicted on five basic assumptions: the graduate student is the single greatest national resource this nation possesses; the main purpose of graduate educa-

tion up to now, i.e., replicating the graduate faculty, needs rethinking; that replication is now rapidly coming to an end because this need is satisfied, now and for some time; a natural resource is too valuable to leave to the whims of supply and demand and the chance intervention of government, foundations, etc.; and the need to preserve a natural resource is not to be confused with the mismanagement of that resource.

Reducing the enterprise is not the answer; we need to find fresh ways to educate and utilize our graduate students and to extend and direct the doctorate into areas where this expertise is sorely needed. The present crisis in higher education is but a part of the larger crisis of our culture as a whole, and we in higher education have been irresponsible, both as teachers and citizens, in solving it. The solutions proposed are the following: start with a radical reevaluation of our values and instill in our students the idea that teaching at all levels is honorable, satisfying, and useful; identify areas of employment for Ph.D.'s formerly shunned, such as in the two-year and smaller colleges; and determine what the problems and needs of these institutions are and direct our disciplinary knowledge to these areas and to applications in other fields so that students are prepared for these roles.

In solving our problems, the D.A. is not our angel of salvation, for the Ph.D. is broad and flexible, capable of being made to signify more than research competence alone. The purpose of the humanities is to humanize; it is time that we stop making snobs of our students and teach them to respect other career opportunities and persons, to understand their needs, and prepare them to meet them without condescension.

- Whaley, W. Gordon, editor

<u>In These Times: A Look at Graduate Education with Proposals for the Future</u>

The Graduate Journal. University of Texas. Austin. 1971.

The essays which comprise this book express the concern about the present dilemmas and future hope of American graduate education. The authors are university administrators, scholars and researchers, business executives, and others involved in the increasingly complex process of graduate education.

Stephen Spurr seeks to define terms and clarify criticisms which seem to confuse the aims of graduate education with those of undergraduate education or vocational training. Gustave Arlt makes the key point that undergraduate and graduate education are simply two different kinds of pursuits and no attempts to unify them will solve the problems of either.

Several of the essays criticize the work ethics of the graduate institution; point out the responsibility of the advanced levels to support and improve the lower levels of education; cover the continuing problems of student unrest and campus politicization; and suggest that large socio-technological problems can best be solved by institutions other than the modern university.

Harvey Brooks and Howard Bowen identify interrelated current difficulties on the unresponsiveness of government to developing needs in the face of declining local support and the resultant compromising of responsiveness to public needs.

The problems dealt with generally in the first group of essays are focused upon individually in the following sections. Suggestions for future action cover a wide variety of opinions but all agree that to survive graduate education must change considerably. Gould and Jones argue for new programs on the changing social needs and the changing employment market for advanced degree recipients and Neal and Benezet are concerned with degree requirements. There are articles on the university, its history, relevance, and place in society. Other essays place emphasis on the humanities, ethnic studies, establishment of research centers, the D.A. degree, and the training of college teachers.

The final chapter draws together some of the issues raised and proposes some possible resolutions: new diversity in both master's and doctoral level programs; nonresearch degrees; and continuing education programs. The conclusion is that to find the new directions for graduate education, its limitations must first be recognized and graduate educators must have the courage to make adjustments.

PLANNING, FINANCING, AND COORDINATION

• Balderston, Frederick E., and George B. Weathersby

PPBS in Higher Education Planning and Management from PPBS to Policy Analysis

Ford Foundation Program for Research in University Admistration, Grant No. 680-0267 A, Paper P-31. Office of the Vice President--Planning, University of California. Berkeley. May, 1972.

This is one of the continuing series of reports conducted under the Ford Foundation sponsored program addressed to better understanding the modern management of university systems and the allocation of educational resources. Because of the interest in and increasing usage of formal planning-programming-budgeting-systems (PPBS), this report carefully analyzes the nature and role of PPBS and its potential impact on higher education.

Part one describes the salient features of PPBS and traces the development and related analytical techniques in governmental agencies and institutions of higher education. Part two illustrates both the concepts and implementation of PPBS by a detailed explication of the University of California's experience with it. Part three suggests a form of policy analysis for educational planning which is an alternative to traditional PPBS and concludes with a case study of policy analysis applied to year-round operations and with general suggestions for managers seeking to improve their resource allocation procedures.

The benefits and the complexities of PPBS may not be worth the costs in all situations, and educational institutions should carefully weigh these

factors and realize there are no easy, automatic answers to the problems of higher education.

- Bennett, Ivan L., Jr.

Some Suggestions for Improving the Administration of Federal Programs of Support for Academic Science

Unpublished paper. Office of the Director, New York University Medical Center, New York. 1972. (Mimeographed.)

Developments over the past five years make advisable a series of changes in the administration of academic sciences: federal support for academic science and for general support at colleges and universities had both expanded significantly until the recent reductions; the reductions, unpredictability, and instability of funding have created problems in the universities, and are incompatible with long-range national goals and the missions of federal agencies; and the accretion of federal restrictive practices has created administrative machinery unnecessarily complicated and expensive both for the universities and the federal government. The long-range solutions to these problems are considered in the following recommendations: establish more stable funding for academic science through a "three-year indicative plan"; continue to strengthen the existing system of pluralistic support but compensate for inequities and imbalances through increases in the budgets of NSF and NIH; improve the administration of federal academic science programs by Presidential directive to the Office of Management and Budget to discharge this responsibility; improve the organization of the Executive Office for science and education by establishing by statute a new Council of Advisors on Education and Science; and consider the establishment of a new cabinet Department of Higher Education and Sciences to deal with the increasing problems.

- Burke, William J.

Graduate Education in the Decades Ahead

Graduate Education Today and Tomorrow. Leonard J. Kent and George P. Springer, editors. University of New Mexico Press. Albuquerque. 17-29. 1972.

The author indicates that there is a need for critical reassessment of the goals and procedures for education from kindergarten through graduate school and beyond. Innovation in education and the subsequent required drastic changes in employment practices are needed. He suggests that through research and advanced planning we can make more effective use of our available human, physical, and financial resources. Shortening the elementary and secondary programs from twelve to ten years would make funds available for supporting needed research resources, both material and human. Emphasis is given to enhancing and enriching the educational experiences of the lower grades, encouraging community colleges, and support for full-time graduate students.

- The Carnegie Commission on Higher Education

Institutional Aid: Federal Support to Colleges and Universities

McGraw-Hill Book Company for The Carnegie Commission on Higher Education. New York. February, 1972.

The major themes covered in this report are: that the federal government should provide substantially greater funds for higher education, including funds to institutions for general support of educational programs; concern with institutional support within the totality of federal support programs for higher education which include expenditures for student aid, research, construction grants, and loans, and a variety of special programs such as cooperative education, community education, and developing institutions; the favoring of the GI Bill of Rights approach, since it makes the greatest contribution to national welfare, provides substantial support to nearly all institutions without running major risks of constitutional challenges for many of them or of reduced state support for still others, and preserves to the maximum of freedom of choice for students and the autonomy of institutions and state systems; that it provides new analytical data about the impact of different formulas on different types of institutions--for example, whether allocations are made on the basis of enrollment or on degrees granted, or head count, etc.; concern with federal aid and adequate state support--in particular, only the states can create a viable balance between public and private institutions; and concern with federal legislation affecting education.

- The Carnegie Commission on Higher Education

The More Effective Use of Resources: An Imperative for Higher Education

McGraw-Hill Book Company for The Carnegie Commission on Higher Education. New York. 1972.

Reversing an earlier recommendation calling for large increases in federal and state funding for higher education, The Carnegie Panel now urges cutting college costs by 20% by 1980. The Commission advocates that 1980 expenditures should be held to a level around $41.5 billion as against $51 billion per year, or a reduction of nearly $10 billion in 1970 dollars as compared with the costs which would be incurred if the trends of the 1960's were to be continued. The Commission believes that higher education can close the resources gap without any general deterioration in quality by reducing the total number of years of student training and by reducing the number of "reluctant attenders." Saving money and reducing the cost per student per year below what it might otherwise be, could be accomplished by accelerating programs for motivated students; halting new Ph.D. programs except under special circumstances; achieving minimum effective size for campuses and their departments; cautiously raising the student/faculty ratio; reexamining faculty teaching load; improving management and budgeting processes; and by creating more educational alternatives off campus.

Other key recommendations made in the report suggest: that institutions engaged with faculty unionism should employ staff members or consultants

experienced in collective bargaining, and who consider agreements that induce prodictivity of faculty and academic employees; and that higher education itself should undertake internally the constructive actions necessary to get more effective use of resources.

- Eurich, Alvin C., editor

Campus 1980: The Shape of the Future in American Higher Education

Delacorte Press for The Academy for Educational Development. New York. 1968.

The thrust of the essays which compose this book is toward the predictable concerns that are facing the nation's universities and students in the next decade. The topics covered are the size and makeup of the campus, the increasing size of student bodies, the relationship of city and university, national and international needs, the future of teaching, curriculum, continuing education, and graduate education and research. Of particular interest in graduate education are the articles by Sidney G. Tickton and Allan Cartter.

- Glenny, Lyman A.

Trends Are Impelling Higher Education Toward State and Regional Planning

College and University Business, Volume LII, No. 5, 43-48, May, 1972.

Glenny reviews and analyzes the important social, economic and political trends that influence higher education, their importance to planning, and the consequences of pursuing certain courses of action as against others into an uncertain future. He concludes that not even a combination of all the proposed solutions would really meet the basic needs arising from current trends, all of which point directly to increasing reliance on greater centralization of planning in the form of state coordinating boards and regional organizations which may aid in making the most use of state resources.

The major trends mentioned by Glenny as controlling are: enrollments as a whole are not likely to increase after 1977-78 and for ten years thereafter they will diminish; the young people who may attend college from now until 1990 are already living--this will affect both undergraduate and graduate enrollments; the proportion of the state budget going to higher education will be no greater in 1980 than it will be in the next year or so regardless of the circumstances because some states have already reached their funding capacity, and there will be insufficient funds for higher education due to competing social priorities and changing attitudes about higher education; a trend forcing the student to pay more and more of the total costs of his education, either the full cost as he attends as tuition or through loans to be repaid later; increased tendency for students to attend proprietary and industrial schools rather than traditional colleges and universities; the drift is away from liberal education, the university and the complex college, especially those offering graduate degrees; new means for education--the external degree, university without walls, work-study

programs and new emphasis upon part-time study have emerged and will have a profound effect on what is done within existing higher institutions; the final trend, collective bargaining and unionization, is as important for states as any other factor and will have substantial influence on the autonomy of the institution and the development of higher education as "anything and everything" becomes negotiable and a new power structure results.

- Hackerman, Norman

The Future of Graduate Education, If any (Editorial)

Science, Volume CLXXV, No. 4021, 475, February 4, 1972.

The author challenges the validity of these concepts: graduate education in the U. S. developed on undergraduate college campuses because its presence was synergistic to the total educational enterprise; the rationale for expanding doctoral degree programs is the need for more holders of the Ph.D.; and these programs are required to attract and hold better faculty. He suggests four possible solutions: continue to seek increased support for increased costs and for expansion; self limit proliferation on individual campuses by not acceding to the "attraction" argument; limit the number of universities offering a broad spectrum of courses; and agree that enhancement no longer pertains and, therefore, separate graduate from undergraduate education. Hackerman agrees that the continuing vitality of graduate education as an important national objective should not be diminished, but suggests that the problem is serious and that his fourth possible solution deserves exploration.

- Kerr, Clark

New Challenges to College and University

Agenda for the Nation. Kermit Gordon, editor. Doubleday & Company, Inc. for the Brookings Institution. Garden City, New York. 1968.

This paper discusses the following themes: four historic stages in the relation of the federal government to higher education; the major current problems of higher education; the several ways in wihc higher education has served the nation and has become a prime national resource; the impacts of federal aid on the functions of institutions and the distribution of power within them; and the major alternative methods by which the federal government may finance higher education. In the final section, Kerr makes several recommendations regarding federal aid in the future.

- Magoun, H. W.

  Geographic and Institutional Aspects of Graduate Education and Research

  Graduate Education Today and Tomorrow. Leonard J. Kent and George P. Springer, editors. University of New Mexico Press. Albuquerque. 78-99. 1972.

  This report was contributed to the Festschrift to Gustave Arlt. An abstract prepared from a mimeographed version appears under the same title in An Annotated Bibliography on Graduate Education, 1950-1971, July, 1971.

- National Research Council. Division of Mathematical Sciences. Committee on Support of Research in Mathematical Sciences. Lipman Bers, Chairman

  Mathematical Sciences: A Report

  Publication 1681. Prepared for the Committee on Science and Public Policy, National Academy of Sciences. Washington, D. C. 1968.

  This report on the mathematical sciences is another in the series of comprehensive survey reports on major fields of science prepared under the aegis of the Academy's Committee on Science and Public Policy. The purpose of this report is to identify the major demands, to assess the capabilities of the mathematical community to satisfy them, and to propose measures for preserving and extending these capabilities. The report found that society today, especially through other sciences and technologies, makes unprecedented demands on mathematics and on the community of mathematical scientists. The Committee makes six recommendations in order to meet these demands: improvement in the quality of education in the mathematical sciences at the undergraduate level through expanded federal support; maintenance of momentum in research, research apprenticeship, and graduate education; support for the explosive growth of computer science; support of research and education in the applied mathematical sciences as such; agencies and mechanisms for federal support of research and research apprenticeship in the mathematical sciences; and a continuing program of information gathering.

- U. S. Congress. Joint Economic Committee

  The Economics and Financing of Higher Education in the United States. A Compendium of Papers Submitted to the Joint Economic Committee, Congress of the United States

  U. S. Government Printing Office. Washington, D. C. 1969.

  This series of 24 papers on the structure, growth, and finance of higher education is divided into six parts. The first presents an overview of basic issues involved in the economics of higher education and identifies factors which must be considered in formulating policy. Part two considers the two most basic criteria for a higher education system--efficiency and equity--in terms of their conflicting natures and the compromises necessary

between them. Part three discusses costs and outputs. Parts four and five consider, respectively, the outlook for American higher education in the next decade in terms of enrollment, expenditures, staff and degrees granted, and the economic outlook for private institutions. The first section of part six outlines prospects for nonfederal financing--state and local government aid--and endowment contributions. The second section discusses the role of federal aid, not merely in supplementing other sources of finance but also in helping direct higher education toward goals set by the American public.

- Wilson, Logan

Shaping American Higher Education

American Council on Education. Washington, D. C. 1972.

The author, in this compendium, has selected 26 of his papers or essays that focus attention on the necessity of a realistic approach to problems and issues of general import to higher education. He treats his subject from the unique vantage point and with the varied experience gained as an academic practitioner, administrator, and acknowledged professional leader. Certain themes, arrayed in five parts, run throughout the book, as they do in institutional life. These center on and stress the major topics of: relationship of higher education to national purpose; the planning essential for orderly change; and the recognition that institutional goals and practices, as well as national expectations, be related to a concern for quality and for the essentially intellectual and cultural character of the higher education enterprise.

NATIONAL SCIENCE POLICY & NATIONAL EDUCATIONAL POLICY

- Abelson, Philip H.

Science in the Seventies

Paper given at The Annual Evening of The Carnegie Institution, Washington, D. C. May 4, 1972.

On the occasion of the 1972 Annual Evening, the author, as President of the Carnegie Institution, presented this address. He touched on some of the major influences that will shape the scientific enterprise and its opportunities during the 1970's. Government funds have constructive potential, but wasteful expenditure of large sums of money directed narrowly could have little positive but substantial damaging effects to all science. The mining-out process is very real in physics and chemistry, though the accumulation of knowledge in these sciences has greatly enriched astronomy, the earth sciences, and biology and medicine; new concepts and new instrumentation can rejuvenate fields of inquiry, and examples of research opportunities for significant work in these sciences are described.

- Brademas, John

National Institute of Education May Be the Best Hope for Revolution

College and University Business, Volume LIII, No. 1, 39-41, July, 1972.

Representative Brademas, who sponsored legislation to create the National Institute of Education, expresses hope that establishing NIE may prompt a research and development revolution that will transform educational research into a science of change. Further, unless education, which is nearly a $70 billion a year conglomerate of American social systems responds actively and productively to the changes required, it is in danger of becoming a dinosaur among social systems.

He believes that the aims and tasks of the NIE staff and the institutions it will engage to conduct research should be: to conduct basic research of the learning process; to give special attention to crucial national problems in education, for example, education of the disadvantaged; to study educational finance at every level from preschool through postgraduate school; to set a high priority for developing measures to assess and evaluate the effectiveness of education and for shaping ways for helping schools apply these measures intelligently to the education they provide; to consider ways of improving the education of educators; to enhance educational practice in terms of both the content of what is taught and the means by which it is taught; to foster more and better research and to assure that the results are disseminated throughout the educational system with NIE responsible for both functions; and, finally, to direct searching inquiry into new areas such as continuing and mid-career education, nonformal and extra-institutional ways of learning, and the relationship between the public and non-public sectors of education.

- Educational Commission of the States. Clinic Session No. 9. Werner A. Baum, Chairman.

Graduate Education in the Next Decade: Adjusting Priorities for the Nation

Report of the Fifth Annual Meeting of the Educational Commission of the States, Compact, Volume V, Special Issue. Boston, Massachusetts. 20-25. July 7-9, 1971.

The Report of the Fifth Annual Meeting of ECS summarizes a clinic session involving seven participants. The central theme discussed by the panelists was too much growth and too little money. The respective roles and responsibilities of the federal government, state governments, and educational institutions in the review and evaluation of graduate educational needs, the fields in which programs should be offered, and the financial support of programs were reviewed. The panel called for a joint effort in the formulation of a national policy on graduate education.

- The President's Message to the Congress--March 16, 1972

  Science and Technology

  Weekly Compilation of Presidential Documents, Volume 8, No. 12, 581-591, March 20, 1972.

  President Nixon, in his Message to the Congress, calls for a strong new effort to marshal science and technology in the work of strengthening our economy and improving the quality of our life. He proposes six ways to accomplish this objective: putting the scientific discovery to work by combining the genius of invention with the skills of entrepreneurship, management, marketing and finance; seeing that the environment for technological innovation is a favorable one; realistically appreciating the limits of technological innovation and thereby better marshaling its strenths; recognizing the need for scientific and technological manpower and encouraging young people who believe they will find satisfaction in such careers to undertake them; recognizing the importance of the support of basic research in both the public and private sectors today as essential to our continuing progress tomorrow; and forming a new partnership, bringing together the federal government, private enterprise, state and local governments, and our universities and research centers into a coordinated, cooperating effort to serve the national interest.

  Strengthening the federal role and focusing our scientific resources in meeting civilian needs are urged by outlining a six-point strategy and recommending a 65% increase in funding. The federal support of R&D in the private sector is recommended as necessary and desirable through cost-sharing agreements, procurement policies or other arrangements. Ways of applying government-sponsored technologies are outlined via the National Technical Information Service, new incentives programs of NSF and NBS, the Science Advisor, and the Secretary of Commerce. Five specific ways to improve the climate for innovation are delineated. Stronger federal, state and local partnerships are to be fostered by the Science Advisor and the Office of Intergovernmental Relations focusing on three specific subjects. Lastly, world partnership in science and technology is stressed by inviting other countries to join in U. S. research efforts at specific centers, through agreements (People's Republic of China and U.S.S.R.), and via the UN.

- Stever, H. Guyford

  Proposed Increase in Civilian Research and Development Aimed at Improving Productivity and the Quality of Life--Basic Research Recognized

  Testimony before the Committee on Science and Astronautics, House of Representatives. February 9, 1972. (Mimeographed.)

  As the newly appointed Director of NSF, Stever lists the major objectives of NSF for FY 1973 in support of requested authorization: strengthen basic research to increase fundamental knowledge and to provide the scientific data needed for continued application of science and technology to the needs of the nation; test incentives to encourage increased nonfederal

investment in research and development; undertake selected efforts to focus research on national goals in major areas of domestic concerns; and improve our understanding of science policies and the impact of $&D in our economy and society. He elaborates upon the questions of fundamental research support, research applied to national needs, and special program initiatives.

PUBLIC SERVICE, ADVISORY AND RESEARCH COMMITTEES, EVALUATION & MEASUREMENT OF QUALITY

- Elton, Charles F., and Samuel A. Rodgers

  Physics Department Ratings: Another Evaluation

  Science, Volume CLXXIV, No. 4009, 565-568, November 5, 1971.

  The authors examine the prominent position awarded the American Council on Education studies of Cartter and Roose and Anderson as procedures to evaluate quality in graduate education. Using a spatial configuration analysis involving six objective variables arbitrarily chosen as predictor viriables in a stepwise, multiple discriminant analysis, physics departments rated in the Cartter study were analyzed. The study found that objective variables provided a good approximation of the numerical ratings of the physics graduate programs in the Cartter study. The method was reported applicable to and gave similar results for other physical science departments and for departments in the humanities, social, and biological sciences. Since the dividing line between "departmental reputation" and "quality" is, at present, mostly rhetorical, the authors caution that additional study of the correlates of departmental ratings are warranted.

- Gershinowitz, Harold

  Applied Research for the Public Good--A Suggestion

  Science, Volume CLXXVI, No. 4033, 380-386, April 28, 1972.

  The author, from the experience of serving as the first Chairman of the Environmental Studies Board of NAS-NAE and from a distinguished career of service to both the public and private sectors, offers the following approach to the solution of the problems of modern society: techniques that have been developed for the application of physical science to technology have been outstandingly successful; it seems worth applying them or their analogs to both the physical and social sciences in order to benefit the public; to do this, it will be necessary to bring together politicians, administrators, and a special type of distinguished scholar -research worker in a manner that encourages their interaction and cooperation; the successful methods will probably be as diverse as the governments and other socio-political entities that make use of them, and the common element is the recognition that the application of research is a complex operation, involving continuing

interaction and feedback, and is not a simple, orderly process of transmitting information from one place to another; and it is hard to see how research in the public good can be sponsored by any but governments or units closely affiliated with an operating governmental agency--a public authority such as the New York Port Authority or TVA, or a municipality, is suited to innovation and is favored as the mechanism for implementing the plan.

- National Research Council

The Science Committee

A Report by the Committee on the Utilization of Young Scientists and Engineers in Advisory Services to Government. Volumes I and II. National Academy of Sciences. Washington, D. C. 1972.

A National Research Council Committee chaired by Detlev Bronk has examined the nature of the advisory committee in an effort to identify, select, and recruit young scientists for this role, and to consider how this system might be improved. The report issued, entitled The Science Committee, discusses the problems and characteristics of representative advisory committees, and recommends broadening the base of scientific advice to government by expanding the pool of names of prospective advisors, wider use of more younger people, members of ethnic minorities, and women in committee membership. Other pertinent recommendations include that a process of open nominations or self-nominated committees is needed; that obsolescent committees be abolished unless there is a compelling reason for their retention; that terms of committee service be limited to three years normally; that the needs for new committees be weighed critically; that committee work be given greater visibility by more frequent reports to the scientific community and to the general public; and that the advisory process itself be subjected to research.

TITLE INDEX

AAUP Says Faculty Pay Picture Worst Since Records Kept, 10
Academic Anarchy vs. Management of Universities, 4
Academic Demand for New Ph.D.'s, 1970-90: Its Sensitivity to Alternate Policies, 60
Accountability and Autonomy, 23
Accreditation of Physics Graduate Programs, 18
Age and the College Teacher, 1
Age, Aging, and Age Structure in Science, 95
The American College and American Culture: Socialization as a Function of Higher Education, 33
The American Graduate Student: A Normative Description, 103
American Higher Education: Directions Old and New, 36
American Science Manpower, 1970, 46
An Analysis of the Specific Features which Characterize the More Successful Programs for the Recruitment and Training of College Teachers, 90
An Annotated Bibliography of Literature Relating to the Costs and Benefits of Graduate Education, 13
Any Person, Any Study: An Essay on Higher Education in the United States, 36
Applied Research for the Public Good--A Suggestion, 138
Appropriations of State Tax Funds for Operating Expenses of Higher Education 1971-72, 28
Are There Too Many Doctors in the House?, 56
Assessing Candidates for Graduate Study in Political Science, 99

A Bibliography of Reference Materials for Evaluating Foreign Student Credentials, 111
Big Enrollments Worry Chem Departments, 62
Blacks and Professional Schools, 108
The Black Woman Graduate Student, 109
Blueprint for Change: Doctoral Programs for College Teachers, 78
Bounds for New Faculty Positions in a Budget Plan, 10
A Bubble in the Educational Pipeline, 71
Building a Model Doctoral Degree Program in Adult Education, 94

Campus 1980: The Shape of the Future in American Higher Education, 132
Campus Research: A Giant in Trouble, 32
The Capitol and the Campus: State Responsibility for Postsecondary Education, 28
Career Development of Young Women during the Post-High School Years, 117
Chairman's Address (Proceedings of the Tenth Annual Meeting, CGS), 84
Changes in Graduate Programs in Science and Engineering 1970-72 and 1972-74, 91
Changing Careers after Thirty-Five: New Horizons Through Professional and Graduate Study, 105
The Changing Demand for Scientists and Engineers, 49
Changing Patterns of Graduate Education: One Suggested Model, 90
Chemical Employment Should Bottom Out in 1972, 55
Committee V: Engineering, 57
A Compilation of Data on Faculty Women and Women Enrolled at Michigan State University, 115

The Consortium: Cooperation Can Pay Off, 16
Cooperative Graduate Program for Training in Educational Research, 91
The Cost of Higher Education, 1971-72, 7
The Costs and Benefits of Graduate Education: A Commentary with Recommendations, 12
Counseling of Doctoral Candidates, 106
The Crisis of Confidence, 41
A Critical National Problem: Under-Utilization of Teachers and Other College Trained Personnel, 53
Current Research on Sex Roles, 121

Designing Doctoral Programs in Education, 92
Disciplinary and Sex Differences in Doctoral Completion, 118
Discrimination and the Woman Law Student, 118
The Dismal Outlook for Graduate Education, 27
Dissent and Disruption: Proposals for Consideration by the Campus, 2
The Divided Professoriate, 3
The Doctor of Arts Degree, 81
The Doctor of Arts Degree: A Proposal for Guidelines, 74
Doctor of Arts Degree, 85
Doctoral Education in Prestigious Universities, 80
Doctoral Use of Foreign Languages: A Survey, 86
The Doctorate in Speech, 92
The Dynamics of Academic Science, 66

The Economics and Financing of Higher Education in the United States. A Compendium of Papers Submitted to the Joint Economic Committee, Congress of the United States, 134
Education and Employment Patterns of Bioscientists: A Statistical Report, 58
Educational Specialist Programs in Higher Education, 88
Educational Training and Careers of Ph.D. Holders: An Exploratory Empirical Study, 58
Effects of the Ph.D. Glut, 48
Elements Related to the Determination of Costs and Benefits of Graduate Education, 13
Employment and Career Status of Women Psychologists, 113
Employment of New Ph.D.'s and Postdoctorals in 1971, 53
Engineering Education, Parts 1 and 2, 87
Enhancing Psychology by Assessing Its Manpower, 55
Enrollment Projection Models for Institutional Planning, 68
The Ethos of the American College Student: Beyond the Protests, 98
External Degree Programs Give New Life to University Extension, 93
External Programs Can Maintain Quality, UCLA Dean Asserts, 93

Factors Contributing to Current Distress in the Academic Community, 22
Federal Involvement in Nongovernmental Accreditation, 17
Federal Support for Graduate Education Reexamined, 23
Federal Support of Graduate Education, 20
Federal Support of Higher Education: Elitism Versus Egalitarianism, 22

Federal Support to Universities, Colleges and Selected Nonprofit Institutions, Fiscal Year 1970: A Report to the President and Congress, 24
50 Colleges Show a Large Increase in 1970-71 Giving, 26
Fifty Top-Rated Institutions: Their Role in Graduate Education, 34
First-Year, Full-Time Graduate Science Enrollment Continues to Decline, 67
Five Years After the College Degree. Part I: Graduate And Professional Education, 102
A Follow-up Study of Recipients of the Doctor of Education Degree in Industrial Arts Education from Colorado State College, 82
A Fond Farewell to the Status Quo, 2
Forthcoming Intermediate Degree to be Retroactive, 76
The Fourth Revolution: Instructional Technology in Higher Education, 124
The Future Market for Ph.D.'s, 50
The Future of Graduate Education, If Any, 133
The Future of the Graduate Record Examinations Program, A Working Paper, 99

Geographic and Institutional Aspects of Graduate Education and Research, 134
Germany and Japan Form Foundations for Foreign Studies, 27
Giving U.S.A., 26
Graduate Deans as Administrators, 3
Graduate Education--a Long Look, 84
Graduate Education in a Society in Transition: A Working Paper, 125
Graduate Education in the Decades Ahead, 130
Graduate Education in the Next Decade: Adjusting Priorities for the Nation, 136
Graduate Education in the Next Three Decades, 39
Graduate Education Today, 42
Graduate Education Today and Tomorrow, 39
Graduate Programs and Admissions Manual, 17
Graduate School Admissions, 80
A Graduate Student in Population Planning Looks at the Future for Women, 120
A Graduate Student Looks at the "New" Doctor of Arts Degree, 73
Graduate Student Satisfaction: Academic and Non-Academic, 104
Graduate Student Support and Manpower Resources in Graduate Science Education, Fall 1970, 20
Graduate Study in the United States: A Guide for Foreign Students, 109

Hard Times for the Graduate Schools, 25
Higher Education and the Disadvantaged Student,,107
Higher Education for the Future: Reform or More of the Same?, 41
Higher Education, 1980: New Federal Projections, 63
The Higher Learning in America: A Reassessment, 43
The Higher Learning, the Universities, and the Public, 34
Hope for America, 34
How Well Are They Paid? Compensation Structures of Professional Librarians in College and University Libraries, 1970-71, 16

In These Times: A Look at Graduate Education with Proposals for the Future, 128
An Inquiry into Departmental Policies and Practices in Relation to the Graduate Education of Foreign Students, 110

Institutional Aid: Federal Support to Colleges and Universities, 131
Institutionalizing Innovation in Graduate Education, 123
Interdisciplinary Research Relating Community and College Activities, Final Report, 98
Is the Future Bright or Bleak?, 88

Job Market Rallies a Bit for June Graduates, 52
Jottings, 125
Journal of Proceedings and Addresses of the Twenty-First Meeting, 35

The Literature of Higher Education 1972, 40

Manpower in Science and Engineering, Based on a Saturation Model, 61
Manpower Issues in the Professions and Higher Education, 60
The Master's as Preparation for Teaching in Colleges, 56
The Master's as Preparation for Teaching in Secondary Schools, 76
Masters' Degrees in the State of New York, 1969-70, 75
The Master's in Science and Engineering, 75
The Master's in Social Sciences and Humanities, 74
Mathematical Sciences: A Report, 134
Minorities and Advanced Degrees, 107
Mobility in the Negro Community: Guidelines for Research on Social and Economic Progress, 110
Mobility of Ph.D.'s Before and After the Doctorate, with Associated Economic and Educational Characteristics of States, 59
The More Effective Use of Resources: An Imperative for Higher Education, 131
More on the Numbers Game, 70
Ms. Fellow, 119

A National Focus of Science and Research, 35
National Institute of Education May Be the Best Hope for Revolution, 136
NDEA Fellowships for College Teaching, 1958-1968; Title IV, National Defense Education Act of 1958, 31
New Challenges to College and University, 133
The New Depression in Higher Education: A Study of Financial Conditions at 41 Colleges and Universities, 9
New Models for Graduate Education, 40
New Needs, New Responses: Annual Report 1969-71, 100
The New Orthodoxies in Higher Education, 43
New Students and New Places: Policies for the Future Growth and Development of American Higher Education, 62
The Nonprofit Research Institute: Its Origin, Operation, Problems, and Prospects, 83
The Numbers Game: A Study of Enrollment Patterns in Private Colleges and Universities, 65

Obstacles to Graduate Education in Political Science, 123
Of Time and the Doctorate--Report of an Inquiry into the Duration of Doctoral Study, 85
Optimality in College Planning: A Control Theoretic Approach, 15
The Outlook for Educated Manpower, 51

The Outlook from Industry, 50
The Outlook from the Federal Government, 24
The Outlook from the University (the Humanities), 73
The Outlook from the University (the Natural Sciences), 47

Panel on Alternate Approaches to Graduate Education, 38
The Ph.D. Degree at Berkeley: Interviews, Placement, and Recommendations, 8
Ph.D. Degrees in a Changing Scene, 79
Ph.D.: It Has Become a Problem Degree, 80
The Ph.D. Production Function: The Case at Berkeley, 8
Ph.D.'s and the Market Place, 49
Ph.D.'s Coming and Going, 60
Ph.D.'s Coming and Going, 1
Ph.D.'s Should Be Planned, 52
The Ph.D. Surplus--Realities and Illusions, 64
Ph.D. Surplus Seen Overestimated, 65
Physics Department Ratings: Another Evaluation, 138
Piling Higher & Deeper: The Shame of the Ph.D., 83
The Plight of the Graduate School: One Dean's Views, 30
The Politics of Projection: A Critique of Cartter's Analysis, 70
Population Trends of the 1960's, 68
PPBS in Higher Education Planning and Management from PPBS to Policy Analysis, 129
Pre-doctoral Fellowships and Traineeships, 18
Priorities for Research and Action in the Graduate Foreign Student Field, 107
Proceedings of the Ninth Annual Meeting, 4
Program Classification Structure Builds Common Frame for Discussion, Analysis, 11
Projections of Educational Statistics to 1977-78, 69
Projections of Enrollments in Public and Private Colleges and Universities, 69
Projections of the Doctorate Population, 63
Proposed Increase in Civilian Research and Development Aimed at Improving Productivity and the Quality of Life--Basic Research Recognized, 137
Prospects for Graduate Student Support from Federal Funds in the '70's, 19
The Prospects for Higher Education, 33
The Publishing Behavior of Graduate Students in Reading, 106

Recent Trends in Enrollment and Manpower Resources in Graduate Science Education, 1969-70, 67
Reflections on the Future of Universities and of University Women, 127
Reform in Graduate Education, 126
Reform in Graduate Education: A Proposal, 94
Reform on Campus: Changing Students, Changing Academic Programs, 103
The Relevance of Residence Requirements, 73
Report by the President: The Reasons Why, 124
Report of the Committee on the Future of the Graduate School, 38
Report of the Committee on the Status of Women in the Faculty of Arts and Sciences, 114
Report on Federal Predoctoral Student Support: Part II - Students Supported Under Training Grants of the National Institutes of Health and the National Institute of Mental Health, 29
Report on GRE Restructuring, 101

Report on the CGS Doctorate Production Survey, 45
Report on the Council of Graduate Schools Graduate Record Examinations Board 1971-72 Survey of Graduate Enrollment, 61
Report on Higher Education, 42
Research and the Universities, 78
Research Component--Natural Sciences, 77
Research Component--Social Sciences and Humanities, 75
The Response of Graduate Enrollment to Placement Opportunities, 65
Review of Research: Career Planning and Development, Placement, and Recruitment of College-Trained Personnel, 86
A Review of Science in American Society: A Social History, by George Daniels, 37
The Role of Engineers and Scientists in a National Policy for Technology, 54
The Role of the Graduate School in Continuing Education, 89
The Role of the National Science Foundation in Graduate Education, 29
Role of Women in Administration in State Universities and Land-Grant Colleges, 120

Science and Technology, 137
The Science Committee, 139
Science in American Society: A Social History, 37
Science in the Seventies, 135
The Science Manpower Market in the 1970's, 51
Scientific Human Resources: Profiles and Issues, 54
A Seminar on Graduate Education Programs, 87
Setting National Priorities: The 1973 Budget, 21
Sex Discrimination and Contract Compliance, 121
The Shame of the Graduate Schools: A Plea for a New American Scholar, 88
Shaping American Higher Education, 135
Shifts in Doctorate Output by Types of Universities in the '60's and Projected for the '70's, 45
Small Market for Ph.D.'s: The Public Two-Year College, 49
Some Suggestions for Improving the Administration of Federal Programs of Support for Academic Science, 130
Some Thoughts on Graduate Education in the Year 2000, 125
Sources of Federal Support for Higher Education: Experimental Systems for a National Information Network, 14
State Aid to Private Higher Education, 30
The Status of Academic Women, 115
Status of Women in Graduate Departments of Sociology, 1968-69, 116
Structural Issues in the Supply and Demand for Scientific Manpower: Implications for National Manpower Policy, 57
The Student in Graduate School, 105
Students Enrolled for Advanced Degrees, Fall 1969: Summary Data, 69
Student Tuition Models in Private and Public Higher Education, 15
The Study of Education at Stanford: Part VII, Graduate Education, 42
The Study of Graduate Education at Stanford, 126
Study of NDEA Title IV Fellowship Program: Phase I, 30
Study of NDEA Title IV Fellowship Program: Phase II, 19
Success and Attrition Characteristics in Graduate Studies, 104

Summaries of GRE Validity Studies 1966-1970, 101
Summary Report 1971: Doctorate Recipients from United States Universities, 46
Supplemental Statement on the Doctor of Arts Degree 1972, 77
The Supply and Demand for Graduates of Higher Education: 1970 to 1980, 48
Supply and Demand for Psychology Ph.D.'s in Graduate Departments of Psychology: 1970 and 1971 Compared, 56
Supply, Demand, and Salary Profiles, as Seen by a Graduate Department Head, 57
A Survey of Graduate Programs in Adult Education in the United States and Canada, 64
A Survey of Programs for Disadvantaged Students in Graduate Schools, 109

The Teaching of Science to Students at a Distance, 89
The Tenure Debate, 5
Testing Practices, Minority Groups, and Higher Education: A Review and Discussion of the Research, 100
Trends Are Impelling Higher Education Toward State and Regional Planning, 132
Trends in Graduate Education in Science and Engineering, 1960-70, 66
The Turning Point, 11
Two-Year College Teachers in the Making, 82
Two-Year Master's Program in Engineering, 84

The Uneasy Future of Academic Tenure, 5

Varieties of Financial Crisis, 7

War Protest on U. S. Campuses During April, 1972, 97
We Must Market Education, 9
We're the Agency to Guard the Basic Research End of the Spectrum, 31
What Can the Two-Year College Do for the University?, 127
What's Bugging the Students?, 97
Whither the Ph.D., 78
The Woman Graduate Student in Sociology, 117
Women: A Bibliography on Their Education and Careers, 121
Women Graduate Students in Political Science, 119
Women in Academia, 114
Women in Higher Education, 118
Women in the Graduate Academic Sector of the University of California, 116
Women's Rank, Pay, and Tenure Status Found Behind Similarly Qualified Men's, 113
The World of Higher Education, 79

AUTHOR INDEX

• Abbott, Michael,C., 73
Abelson, Philip H., 20, 135
Adams, Richard P., 73
Adams, Velma A., 7
Ad Hoc Committee of The Coordinating Committee on Graduate Affairs, 116
Alberty, Robert, 47
Alderman, Jeffrey D., 16
Alpert, Daniel, 73
American Association of Fund-Raising Counsel, 26
American Association of State Colleges and Universities, 74
American Council on Education, 26, 27
American Political Science Association, 99, 123
American Society for Engineering Education, 87
Arnold, Joseph P., editor, 87
Arrowsmith, William, 88
Arter, Margaret Helen, 120
Ashby, Eric, 36
Astin, Alexander W., 97
Astin, Helen S., 107, 113, 117, 121

• Balderston, Frederick E., 7, 60, 129
Bayer, Alan E., 97
Ben-David, Joseph, 36
Bennett, Ivan L., Jr., 130
Bock, Robert M., 25, 60
Boddy, Francis M., 74
Bohm, Henry V., 75
Booth, David, 123
Boyd, William L., 22
Boyer, Ernest L., 2
Brademas, John, 136
Breneman, David W., 8
Brennan, Michael J., 27, 75
Brode, Wallace R., 61
Bronk, Detlev W., 35
Brookings Study Group, 21
Bureau of College Education, The New York State Education Department, 75
Bureau of Social Science Research, Inc., 102
Burke, William J., 130
Burns, Richard L., 61, 99

• Cairns, T. L., 50
Cameron, Donald F., 16
Campbell, Roald F., 22
The Carnegie Commission on Higher Education, 2, 28, 62, 103, 124, 131
Carr, Robert K., 5
Cartter, Allan, 1
Chambers, M. M., 28
Chandler, Marjorie O., 69
Cheit, Earl F., 9
Chemical and Engineering News, 62
The Chronicle of Higher Education, 63
Cobb, Jacob E., 76
Columbia Reports, 76
Consolazio, William V., 66
Cooke, W. Donald, 77
The Council of Graduate Schools in the United States, 45, 77
Crawford, Bryce, Jr., 124
Creager, John A., 103

• Daniels, George H., 37
Decker, Robert L., 104
Deener, David R., 12, 78
DeLisle, Frances H., 78, 88
DeWitt, Laurence,B., 48
Dickey, Frank G., 17
Dillon, John A., Jr., 78
Dressel, Paul L., 78, 79, 88
Drucker, Daniel C., 88
Duchan, Linda, 114

• Eckert, Ruth E., 1
Educational Commission of the States, 136
Educational Testing Service, 100
Elton, Charles F., 138
Ericksen, Stanford C., 90
Eurich, Alvin C., editor, 132

• Falk, Charles E., 54, 63
Federal Interagency Committee on Education, 18, 29
Fields, Cheryl M., 113
Flaugher, Ronald L., 100
Fontaine, Thomas D., 19
Fox, Greer Litton, 117
Fram, Eugene, 9

Freeman, Richard B., 51
Fullam, Marie G., 69

• Gagnon, John H., 37
Gardner, Eldon J., 79
Gershinowitz, Harold, 138
Ginzberg, Eli, 51, 110
Glenny, Lyman A., 132
Gorter, Wytze, 125
Graduate Record Examinations Board, 17, 38, 101
Gregg, Wayne E., 104

• Hackerman, Norman, 133
Hadley, Paul E., 89
Halpern, Jonathan, 10
Handlin, Mary F., 33
Handlin, Oscar, 33
Hansen, Harold P., 64
Harari, Maurice, 107
Harvard University, 38, 114
Harvey, James, 48, 49, 80, 105, 107
Hawkridge, David G., 89
Hechinger, Fred M., 80
Heim, Peggy, 16
Heiss, Ann M., 80, 125
Heyns, Roger, 121
Hiestand, Dale L., 105, 110
Higher Education and National Affairs, 10
Hobbs, Nicholas, editor, 33
Holden, Constance, 52
Holmstrom, Engin I., 19
Hooper, Mary Evans, 69
Houser, Carolyn, 120
Howard, Bill, 108
Humphreys, Lloyd, 29
Huther, John W., 49

• Ingham, Roy J., 64

• Jacobson, Robert L., 65
Jellema, William W., 65
Jenny, Hans.H., 11

• Kaysen, Carl, 34
Keniston, Kenneth, 97
Kennedy, Thomas J., Jr., 22
Kent, Leonard J., editor, 39
Kerr, Clark, 133
Kidd, Charles V., 23, 45, 50
Koen, Frank, 90
Koenker, Robert H., 81
Kramer, Noel Anketell, 118

• Ladd, Everett C., Jr., 3
Lamson, Robert D., 11, 13
Lannholm, Gerald V., 101
Lemonick, Aaron, 30
Lewin, Arie, 114
Lindquist, Clarence B., 31
Lipset, Seymour Martin, 3
Lloyd, Wesley P., 3
Lucki, Emil, 39

• McCarthy, Joseph L., 12
McConnell, T. R., 23

• Mack, Grace E., 109
MacNair, Ray H., 98
Magoun, H. W., 134
May, William W., 90
Mayhew, Lewis B., 40, 125, 126
Melnick, Murray, 106
Merton, Robert K., 95
Metz, David, 52
Meyerson, Martin, 98
Michigan State University, 115
Miller, Jerry W., 17
Miller, Paul VanR., 91
Moreland, Henry Clifford, Jr., 82
Morris, Jeffrey, 58
Moses, Lincoln E., 65
Myint, Thelma, 117

• National Education Association, 53
National Research Council, 139
_____, Division of Mathematical Sciences, 134
_____, Office of Scientific Personnel, 58
_____, Office of Scientific Personnel, Manpower Studies Branch, 46, 53
_____, Office of Scientific Personnel, Research Division, 59
National Science Board, 54
National Science Foundation, 24, 66
_____, Division of Science Resources Studies, 20, 46, 54, 66, 67, 91
Nelson, Jeffrey B., 82
Noonan, John P., editor, 92

• Orlans, Harold, 83
Orwig, M. D., 68

• Packer, Herbert L., 83
Page, J. Boyd, 45
Pappas, Edward John, 92
Parry, Mary Ellen, 109
Perloff, Robert, 55
Pifer, Alan, 118
Polinger, Madeleine, 55
Powel, John H., Jr., 13
Pratt, Sally B., 79
The President's Message to the Congress--March 16, 1972, 137

• Radner, Roy, 60
Rees, Mina, 84
Reitz, J. Wayne, 24
Rice, Philip M., 40
Roaden, Arliss L., 56
Robinson, Lora H., 115
Rodgers, Samuel A., 138
Roose, Kenneth, 34
Rose, Richard M., 56
Rosenhaupt, Hans, 56
Rossi, Alice S., 116

• Sanders, Howard J., 84
Sasnett, Martena T., 109
Scheader, Catherine, 106
Sells, Lucy W., 118, 121
Sepmyer, Inez H., 109
Sharp, Laure M., 19, 30
Shull, Harrison, 41
Shulman, Carol H., 5, 30
Siembieda, William, 98
Silvert, William, 18
Simon, Kenneth A., 69
Sjoberg, Gideon, 70
Snow, C. P., 34
Snow, Philip, 34
Southern Regional Education Board, 41
Springer, George P., editor, 39
Stanford University, 42, 126
State of Illinois Board of Higher Education, 57
State University of New York, 14
Stever, H. Guyford, 31, 85, 137
Stokes, Sybil L., 119

• Taeuber, Conrad, 68
Task Force on Crucial Issues of NAFSA, 110
Thompson, R. B., 69
Tilly, Charles, 127
Tussing, A. Dale, 48

• United States Commission on Civil Rights, 110
U. S. Congress, Joint Economic Committee, 134
U. S. Department of Health, Education and Welfare, Office of Education, 31, 42, 69
U. S. Department of Labor, 60
U. S. Department of State, Agency for International Development, 111
U. S. News & World Report, 32
University of Maryland Graduate School, 42, 70

• Van Dyne, Larry A., 93
Vaughan, Ted R., 70
Veri, Clive C., 94
Verplanck, William S., 57
Vetter, Betty, 49, 71

• Wagner, W. Gary, 15
Weathersby, George B., 15, 57, 129
Weisinger, Herbert, 127
Wenglinsky, Martin, 94
Western Association of Graduate Schools, 4
Whaley, W. Gordon, editor, 35, 128
Wilkinson, Ernest L., 4
Wilson, Kenneth M., 85
Wilson, Logan, 43, 135
Wiltsey, Robert G., 86
Windle, J. L., 86
Wolfle, Dael, 50
Woodring, Paul, 43
Woodrow Wilson Foundation, 119
Wynn, G. Richard, 11

• Young, M. Crawford, 25

• Zuckerman, Harriet, 95